Canada's Subarctic Universities
Les Universités canadiennes du Moyen Nord

Peter Adams
and
Doug Parker
editors

Association of Canadian Universities for Northern Studies
Association universitaire canadienne d'études nordiques

87-05608/

FRONT COVER/COUVERTURE AVANT

Top Left/En haut, à gauche

Une aérienne du campus, Université du Québec à Chicoutimi, Chicoutimi, Québec
(photo Jules Dufour)

Aerial view of the campus, Université du Québec à Chicoutimi, Chicoutimi, Québec

Bottom Left/En bas, à gauche

Rouyn, Québec, campus principal de l'Université du Québec en Abitibi-Témiscamingue
(photo UQAT)

Rouyn, Québec, main campus of Université du Québec en Abitibi-Témiscamingue

Top Right/En haut, à droite

The Administration building in winter, Laurentian University, Sudbury, Ontario
(photo Frank Mallory)

L'édifice administratif, Université Laurentienne de Sudbury, Ontario

Bottom Right/En bas, à droite

Aerial view of Lakehead University, Thunder Bay, Ontario
(photo Ben Kaminski)

Une aérienne du campus, Lakehead University, Thunder Bay, Ontario

CANADA'S SUBARCTIC UNIVERSITIES/LES UNIVERSITÉS CANADIENNES DU MOYEN NORD

Editors:

Peter Adams
Association of Canadian Universities for Northern Studies
and Trent University, Peterborough, Ontario

Doug Parker
Laurentian University/Université Laurentienne,
Sudbury, Ontario

Association of Canadian Universities for Northern Studies

Association universitaire canadienne d'études nordiques

©ACUNS 1987

130 Albert Street, Suite 1915,
Ottawa, Ontario, Canada K1P 5G4 (613) 238-3525

Deposited at the National Library of Canada
Ottawa
1987

ISBN 0-921421-01-X

Contents/ Table des matières

Preface/Préface

Canada's subarctic universities in context
Le cadre d'action des universités candiennes du moyen nord v
Peter Adams and Doug Parker

Lakehead

Special role for Canada's northern universities 1
Robert G. Rosehart

Universities in the circumpolar north: A comparative analysis 3
Geoffrey R. Weller

Universities, politics and development
in Northern Ontario and Northern Sweden: A comparative analysis 17
Geoffrey R. Weller and Robert G. Rosehart

Lakehead University and native people
An emphasis on Northwestern Ontario: Research, education,
community service 35
J. David Bates

Education at a distance: The Lakehead experience 50
Margaret Boone and Dan Pakulak

In search of a niche for small, isolated faculties:
The complementarity of teaching, research, and regional service 56
Roderick W. McLeod, J. David Bates and Laurens L. Korteweg

Contextual patterning:
A key to human service effectiveness in the north 66
C.H. Nelson, D.H. McPherson and M.L. Kelley

The impact of housing shortages on northern development:
A case study 83
James Stafford and Connie Nelson

To spray or not to spray?
The role of exclusive discourse in the Canadian spruce budworm controversy .. 96
Jeremy Rayner and David Peerla

Chicoutimi

L'Université du Québec à Chicoutimi présentation générale 107
Jules Dufour

L'Université et le milieu régional 112
Jacques Desbiens

Les études amérindiennes 117
Jacques Kurtness

Relations inter-ethniques et dynamique de développement en milieu nordique ... 121
Michel Barbeau

Vingt-cinq ans d'archéologie au Saguenay-Lac Saint-Jean 130
Jean-François Moreau

La recherche en ressources minérales à l'Université du Québec à Chicoutimi ... 136
G. Woussen

Remote sensing for plant resources management:
A case study in Lac-Saint-Jean, Quebec, Canada 149
Gilles H. Lemieux in association with René Verreault, Suzie Perron, Gilles Vachon and Martin Labonté

Mesures de givrage sur un câble au Mont Valin 169
Pierre McComber, Jacques Druez et Yvon Lavoie

Laurentian/Laurentienne

Distance education: A northern solution? 183
Marian Croft

The genesis of native studies in Canada 192
Anthony J. Hall

Developing literary publishing in northern Ontario 206
John Flood

Problems associated with research in Boreal & Arctic Ecosystems 210
Frank F. Mallory

Sudbury's new image — A dream becomes reality 214
Keith Winterhalder

Abitibi-Témiscamingue

L'Université du Québec en Abitibi-Témiscamingue et son avenir 227
Rémy Trudel

Allocution aux représentants des quatre universités du Moyen-Nord 241
Jean Descarreaux

Les collections documentaires Louis-Edmond Hamelin
et de la société de la Baie James 246
Serge Allard

L'Université du Québec en Abitibi-Témiscamingue en Milieu Amérindien 248
Micheline Potvin

Economic relations study between the north & the south 250
Romeo Saganash

Méthode d'enseignement de la langue Inuit 255
Dolorès Ortiz

Développement des ressources en loisirs
dans les communautés cries de la Baie James 1982-1986 261
Robert Sauvé

Découpages territoriaux et juridictions politico-administratives
en Abitibi-Témiscamingue et Baie James 266
Enrique R. Colombino

Le project «Grand Canal»:
Une grande idée qui demande de la recherche 269
Hilaire Boissé

Etudes et prospectives environnementales sur le territoire nordique du Québec .. 273
Roger Lemire

La recherche dans le secteur minier 276
Michel Aubertin, Michel Hertel, Jean-Yves Savard et Pierre Verpaelst

Figure 1. The Provinces of Ontario and Quebec to show the "spheres of influence" of the four subarctic universities. Distances are shown from the capital of each Province, Toronto and Quebec City, respectively.

Map by Ian Hastie, Department of Geography, Lakehead University.

Cette figure montre la répartition des «sphères d'influence» des quatre universités médionordiques de l'Ontario et du Québec. Les distances indiquées partent de la capitale de chaque province, soit respectivement Toronto et Québec.

Carte dessinée par Ian Hastie, Département de géographie, l'Université Lakehead.

PREFACE/PRÉFACE

Canada's Subarctic Universities in Context

In the eyes of some, Canada does not have a 'University of the Arctic' which can be compared with the University of Alaska or certain universities in the USSR and Scandinavia. This arises from the fact that the Yukon and the Northwest Territories, which have jurisdiction over education in the northernmost parts of the country, do not yet have institutions of higher learning beyond the college level (see Addendum to this Preface for information on higher education in the North). However, most of the "arctic" universities of other countries operate in regions which, in physical and human terms, would be regarded, in Canada, as 'subarctic'. The University of Alaska at Fairbanks, for example, is located in a well populated dairy farming region, albeit a fairly cold one. The universities in northern Scandinavia (see articles by Weller, herein) are in substantial communities in well forested regions.

This book is the product of meetings, in June 1986, involving four Canadian universities which operate in 'remote', cold, regions with resource-based economies. These regions are subarctic by many measures. The universities do not include Canada's northernmost full university campus (the University of Alberta at Edmonton has that privilege) but they *are*, in terms both of their locations and their mandates, Canada's frontier universities.

The universities concerned are Lakehead University (Thunder Bay, Ontario), Laurentian University (Sudbury, Ontario, which hosted the meetings), l'Université du Québec en Abitibi-Témiscamingue (main campus at Rouyn, Québec) and l'Université du Québec à Chicoutimi (Chicoutimi, Québec). The first mentioned

Le cadre d'action des universités du Moyen Nord

Certains observateurs font remarquer que le Canada n'a pas vraiment d'université de l'Arctique comparable à l'Université de l'Alaska ou à certaines universités de l'U.R.S.S. ou des pays scandinaves. La raison en est que le Yukon et les Territoires du Nord-Ouest, qui ont compétence en matière d'éducation dans les régions les plus boréales de notre pays, n'ont pas d'établissement post-secondaire dépassant le niveau collégial (voir l'Annexe de cette préface, qui donne quelque information sur l'enseignement post-secondaire dans le Nord canadien). Cependant, la plupart des universités «arctiques» de l'étranger fonctionnent dans des régions que nous qualifions de «médio-nordiques» au Canada, du point de vue tant de l'environnement que de la démographie. L'Université de l'Alaska, par exemple, qui est située à Fairbanks, se trouve dans une région d'industrie laitière assez peuplée, bien qu'elle soit plutôt froid. Les universités de la Scandinavie septentrionale (voir les articles de G. Weller, ci-inclus) sont situées dans des agglomérations assez grandes, entourées de forêts.

Le présent Compte-rendu est issu de la Rencontre, à Sudbury en juin 1986, des représentants de quatre universités qui fonctionnent dans des régions périphériques, relativement froides, et dont l'économie est fondée sur l'exploitation des ressources naturelles. De bien des points de vue, ces régions sont subarctiques. Ces quatre universités ne comprennent pas le complexe universitaire le plus boréal du Canada, car c'est l'Université de l'Alberta à Edmonton qui possède cette distinction; mais elles sont bien, sur le plan tant de leur emplacement que de leur mandat, les universités du Nord canadien.

Ces établissements sont l'Université de Lakehead (établie à Thunder Bay, Ont.), l'Université Laurentienne (située à Sudbury, Ont., et hôte de la Rencontre), l'Université du Québec en Abitibi-Témiscamingue (dont le campus principal se trouve à Rouyn, Qué.) et l'Université du Québec à Chicoutimi (Qué.) La première de ces universités est anglophone, la seconde

is an anglophone institution, the last two are francophone and the second operates in both of Canada's official languages. Profiles of each, stressing Northern Studies, appear in Adams (1987).

These universities met, at the instigation of the Association of Canadian Universities for Northern Studies (ACUNS, see Addendum), to share experiences for their mutual benefit and for the benefit of others involved in education in the North, in Canada and abroad. At the meetings, papers were delivered on the nature of each university, its setting, problems etc. and its specialty programs. Then a selection of papers representing the 'northern' research of each institution was presented. The written versions of these papers form the bulk of this book.

At the end of the meetings, the four universities agreed to modest future cooperation. Memorial University of Newfoundland, through its Labrador Institute in Goose Bay, Labrador, has expressed an interest in becoming involved in this cooperative effort.

The reader cannot fail to be struck by parallels between the history, mandates, activities and regional settings of these four, in other ways quite diverse, institutions. For example, each is very conscious of being relatively isolated and each has a very strong consciousness of its region and its regional mandate. The isolation is real! Lakehead, for example, is almost 1000 air kilometres from the seat of the Ministry which is responsible for it, 1450 road kilometres (Figure 1). The President of Abitibi-Témiscamingue, works 950 kilometres from the head office of l'Université du Québec. The regional mandate is particularly clear in the case of Abitibi-Témiscamingue, which is 'responsible' for the huge Baie James area of the Cree and Inuit which straddles the provincial boundary, *the* jurisdiction boundary

fonctionne dans les deux langues officielles du pays, et les deux dernières sont francophones. L'ouvrage de W.P. Adams (1987) fait le portrait de ces universités, en mettant en vedette les Etudes nordiques.

A l'initiative de l'Association universitaire canadienne d'Etudes nordiques (AUCEN, voir à l'Annexe), les représentants de ces universités se sont rencontrés à Sudbury, en vue de se communiquer leur propre expérience, à leur avantage mutuel et à celui des autres personnes s'intéressant à l'enseignement dans le Nord, tant au Canada qu'à l'étranger. La nature de chaque université participante, son environnement, ses difficultés, etc., et ses programmes spécialisés furent décrits lors de la Rencontre. On présenta ensuite un choix de communications représentatives des recherches «nordiques» de chaque université. Les textes de ces communications forment le corps principal du présent Compte-rendu.

A la fin de la Rencontre, les représentants des quatre universités se mirent d'accord sur un modeste programme de collaboration. D'autre part, l'Université Mémorial de Terre-Neuve a exprimé l'intention de participer, par le truchement de son Institut du Labrador, installé à Goose Bay, à cet effort concerté.

Le lecteur remarquera certainement le parallélisme entre le développement passé, les mandats, les activités et le cadre régional de ces quatre universités, par ailleurs fort différentes sur d'autres plans. Chacune d'entre elles est, par exemple, bien consciente de son isolement relatif, et met beaucoup d'accent sur les caractéristiques de sa région et l'importance de son mandat régional. Leur isolement n'est pas un mythe! L'Université Lakehead se trouve à presque 1 000 km par la voie des airs, et à 1 450 km par la route du Ministère dont elle dépend (voir fig. 1). Le président de l'UQAT (Abitibi-Témiscamingue) oeuvre à 950 km de l'administration centrale de l'Université du Québec. Dans le cas de l'UQAT, le mandat régional qui lui a été confié est particulièrement clair, car elle assure l'enseignement supérieur dans l'énorme région de la Baie James, dont les habitants cries et inuit résident des deux côtés de la frontière interprovinciale, limite évidente en matière de compétence scolaire. L'UQAC (Chicoutimi) se trouve au coeur d'une

for the purposes of education. Chicoutimi is the focus of the very distinctive and separate Lac St. Jean region which was for centuries isolated from the rest of Quebec and which still views itself as, and still is, a very distinct portion of that Province. Laurentian is based in the City of Sudbury with its world famous, distinctive, geological and mining landscape, serving a diverse region of northeastern Ontario which extends beyond the treeline. Lakehead is located in Thunder Bay, a busy Great Lakes port with a substantial pulp and paper industry in a farming region surrounded by Canadian Shield terrain in which, among other things, are found some of Canada's largest gold reserves. Naturally, each university is very interested in 'education at a distance', a phrase which includes subsidiary campuses, travelling professors, correspondence courses and high tech. distance education. All four are very interested in Native Studies, a reflection of the demography of their region as is the fact that the French language is so prominent among them as it is in so many parts of the 'middle North' in Canada.

As the Addendum makes clear, there is a great deal of university activity, research and teaching, in northern Canada, to the limit of populated land and beyond. One of the contributions of this book may be to draw the attention of the people of the Yukon and NWT, as they further develop their systems of higher education, to some wells of experience upon which they might usefully draw. Another may be that it will encourage further interaction between institutions in 'subarctic' Canada and their equivalents abroad.

The editors and ACUNS are grateful to all those who assisted with these Proceedings and with the meetings upon which they were based. We are particularly grateful to the Presidents and Rectors of the four universities concerned for enthusiastic

région bien distincte, celle du Lac Saint-Jean, isolée pendant des siècles du reste du Québec, et qui se considère encore, non sans raisons, comme une partie bien distincte de cette province. L'Université Laurentienne, établie dans la ville de Sudbury, dans un cadre géologique et minier très particulier et connu dans le monde entier, assure l'enseignement supérieur dans une région diversifiée du Nord-Est de l'Ontario qui s'étend au-delà de la limite forestière. Quant à l'Université Lakehead, elle se trouve à Thunder Bay, un port actif des Grands Lacs doté d'une industrie papetière importante; il est entouré par une région agricole que limitent les hauteurs du Bouclier canadien où, par ailleurs, se trouvent les gîtes d'or les plus importants du Canada. Bien entendu, chacune de ces quatre universités s'intéresse de près à l'enseignement à distance, en l'étayant par un réseau d'unités d'enseignement satellites, un corps d'enseignants itinérants, un enseignement par correspondance et l'utilisation de moyens techniques perfectionnés pour l'enseignement à distance. Elles s'intéressent vivement aux Études autochtones, en raison de la composition démographique de leur région; la prédominance du français dans leur groupe reflète son utilisation générale dans de nombreuses régions du Moyen-Nord canadien.

Comme l'Annexe le montre bien, les activités universitaires de recherche et d'enseignement sont nombreuses dans le Nord canadien, jusqu'à la limite des terres habitées et même au-delà. Le présent Compte-rendu attirera sans doute l'attention des responsables du développement de l'enseignement post-secondaire au Yukon et dans les T. N.-O., grâce à la description des expériences qui pourraient leur être utiles. De plus, le Compte-rendu encouragera, espérons-le, les interactions entre les établissements médionordiques canadiens d'enseignement et leurs homologues de l'étranger.

Les directeurs de publication de ce Compte-rendu et l'AUCEN remercient toutes les personnes qui les ont aidés dans cette oeuvre, et pour l'organisation de la Rencontre dont elle est issue. Ils remercient en particulier les présidents et recteurs des quatre universités pour leur soutien enthousiaste. MM. Jules Dufour (UQAC), Doug Parker (U. Laurentienne), Rémy Trudel (UQAT) et Geoff Weller (U. Lakehead) représentaient leur université

support. In planning for the meetings, the universities were represented by Jules Dufour (Chicoutimi), Doug Parker (Laurentian), Rémy Trudel (Abitibi-Témiscamingue) and Geoff Weller (Lakehead). This Committee made most important contributions to the project.

The conference, and/or the Proceedings were supported financially or materially by the following: René Fontaine and Gilbert Heroux, Northern Affairs & Mines, Ontario; Raymond Savoie, Ministre des Mines et du Nord, Ministre délégué aux Affaires autochtones, Québec; Promotion of Official Languages Branch, Secretary of State, Ottawa; Ontario Hydro; Hydro-Québec; Lakehead University; Laurentian University/Université Laurentienne; Université du Québec à Chicoutimi; Université du Québec en Abitibi-Témiscamingue; Association of Canadian Universities for Northern Studies; Donat Savoie and the Circumpolar & Scientific Affairs Directorate, Indian and Northern Affairs Canada, Ottawa. This support is gratefully acknowledged.

Finally, we are most grateful to Eileen van Heyst for her assistance throughout and to the participants who gave so freely of their energies. Those who attended the meetings are listed below. Chairpersons are indicated by asterisks.

dans le comité d'organisation de la Rencontre, lequel a fait ainsi d'importantes contributions à cette entreprise.

Le déroulement de la Conférence et la préparation du Compte-rendu ont été soutenus financièrement ou matériellement par les personnes et organismes suivants: MM. René Fontaine et Gilbert Héroux, du Ministère des Affaires nordiques et des Mines de l'Ontario; M. Raymond Savoie, Ministre des Mines et du Nord, Ministre délégué aux Affaires autochtones du Québec; la Direction de la promotion des langues officielles du Secrétariat d'État, Ottawa; l'Ontario Hydro; l'Hydro-Québec; l'Université Lakehead; l'Université Laurentienne; l'Université du Québec à Chicoutimi; l'Université du Québec en Abitibi-Témiscamingue; l'Association universitaire canadienne d'Études nordiques; M. Donat Savoie et la Direction des affaires circumpolaires et scientifiques du ministère des Affaires indiennes et du Nord canadien: nous les en remercions vivement.

Enfin, nous sommes reconnaissants envers Mme Eileen van Heyst pour son aide inlassable, et envers tous ceux qui ont contribué si largement de leur temps. Ci-dessous figure la liste des participants à la Conférence. Une astérique suit le nom des présidents de séance.

Université du Québec à Chicoutimi

Michel Barbeau, Adjoint au doyen des études de premier cycle; Jacques Desbiens, Département des sciences économiques et administratives; Jules Dufour, Doyen des études de premier cycle; Jacques Kurtness, Département des sciences humaines; Gilles-H. Lemieux, Département des sciences humaines; Pierre McComber, Département des sciences appliquées; Jean-François Moreau, Département des sciences humaines; Richard Vézina, Doyen à la gestion académique; Gérard Woussen, Département des sciences appliquées.

Lakehead University

David Bates, Education; Margaret Boone, Nursing; Mary Lou Kelley, Social Work; L. Korteweg, Education; Murray Lankester, Biology and Director of Graduate Studies & Research; Alastair Macdonald, Biology; R. McLeod, Dean, Education; Connie Nelson, Social Work; Dan Pakulak, Continuing Education; Pentti Paularinne, Registrar; David

Peerla, University of California at Santa Cruz; Jeremy Rayner, Department of Political Studies; Robert G. Rosehart, President; James Stafford, Sociology; Geoffrey R. Weller, Political Studies, Vice-President (Academic).

Laurentian University

John Abbott, Algoma College; *Charles Bélanger, Vice-President, Academic; Georges Bélanger, Français; Marian Croft, Director, Centre for Continuing Education; Ron Chrysler, Vice-President, Administration; *John Daniel, President; *Michael Dewson, Dean, Social Sciences; John Flood, English-Hearst; N.J. Forest, Chairman of the Board; Tony Hall, Native Studies, N. Kanhai, Native Studies; Joseph Konarek, Geography; *Laurent Larouche, President, University of Sudbury; Frank Mallory, Biology; Douglas Parker, Dean of Humanities; Linda Parker, Director of Graduate Studies and Research; *Laurence Steven, English; Robert J. Surtees, Nipissing College, *Ashley Thomson, Reference Librarian; *Carl Wallace, History; Keith Winterhalder, Biology.

Université du Québec en Abitibi-Témiscamingue

Serge Allard, Responsable de la bibliothèque; Hilaire Boissé, Fondation de l'UQAT; Madame Hilaire (Gilberte) Boissé; Enrique Colombino, Département des sciences sociales et de la santé; Jean Descarreaux, Président; Roger Lemire, Département des sciences appliquées; André McKenna, Chauffeur; Dolores Ortiz, Département des sciences sociales et de la santé; Micheline Potvin, Département des sciences sociales et de la santé; Roméo Saganash, Département des sciences sociales et de la santé; Robert Sauvé, Département des sciences sociales et de la santé; Jean-Yves Savard, Département des sciences appliquées; Rémy Trudel, Recteur.

Observers

Harald Finkler and John Petrolias, Circumpolar & Scientific Affairs Directorate, Indian and Northern Affairs Canada; Gilbert Heroux, Ministère des Affaires du Nord et des Mines, Ontario; R. Binnette and K. Leyduc, Ministry of Northern Affairs and Mines, Ontario; Peter Adams, Association of Canadian Universities for Northern Studies; K. Katari, Planning Department, City of Sudbury.

Addendum: Higher education in the Canadian North

ACUNS has recently published *Education, Research, Information Systems and the North* (Adams, W.P. 1987). This volume contains a great deal of information on higher education in northern Canada, in the Provinces and the Territories, especially the NWT. Articles in the volume show that, although there is still a great deal to be done, there is a great deal of activity in higher education in Canada's North today. The situation is very different from

Annexe: L'Enseignement post-secondaire dans le Nord canadien

L'AUCEN a récemment publié un ouvrage: *Education, Research, Information Systems and the North* (W.P. Adams, 1987), qui contient de nombreux renseignements sur l'enseignement post-secondaire dans le Nord canadien, tant dans les provinces que dans les Territoires, et particulièrement les T. N.-O. Cet ouvrage montre que, bien qu'il reste encore énormément à faire, les activités d'enseignement post-secondaire dans le Nord de notre pays sont déjà nombreuses. La situation actuelle est très

the 1970's when there was considerable debate about a 'University of the Arctic' (e.g. Symons, 1975; Science Council, 1977 and various early annual reports of ACUNS).

The Arctic College of the NWT (see Stapleton, 1987 and Cleveland, 1987) and Yukon College are developing rapidly as the Territorial Governments' responses to needs in higher education. In the Provincial Norths, the four universities represented in this book (for Ontario and Quebec) and the outpost activities of universities whose main campuses are in 'the south', and local community colleges, have well established programs. The last section of Adams (1987) is a guide to those universities in Canada which have northern interests.

However, in the Territories and the Provinces, we have to be careful *not* to assume that local colleges and universities are the only vehicles for higher education. The Arctic Co-operatives Ltd., for example, has a well established management training program in the NWT (see Lyall 1987), as does the Inuit Nunasi Corporation (Tunraluk 1987). Also there is a variety of more or less independent northern establishments, such as the Inuit Cultural Institute at Eskimo Point, N.W.T. (Shouldice, 1987) and Makivik Corporation's Kuujjuaq Research Centre (Kemp 1987) which are developing educational programs. Even in the Territories, universities from the 'south' have substantial *on-the-spot* degree-level programs such as McGill's Eastern Arctic Teacher Education Program at Iqaluit (Cram 1987, Wilman 1987) and Memorial University's program out of the Labrador Institute in Goose Bay, Labrador. The University of British Columbia has resident faculty in Whitehorse, Yukon (Yerbury, 1987).

Such university activities are common in the Provincial Norths (e.g. the northern program of the universities of Manitoba,

différente de celle qui prévalait dans les années 1970, alors que le projet d' «Université de l'Arctique» causait un vigoureux débat (voir T.H.B. Symons, 1975; Conseil des sciences du Canada, 1977, et divers rapports annuels de l'AUCEN).

Le Collège arctique des T. N.-O. (voir W.H. Stapleton, 1987 et M. Cleveland, 1987) et le Collège du Yukon se développent rapidement, les gouvernements de ces territoires ayant réagi aux besoins d'éducation post-secondaire. Dans les régions septentrionales des provinces, les quatre universités de l'Ontario et du Québec citées dans le Compte-rendu, les unités périphériques des universités dont le complexe principal est plus «méridional» et les collèges locaux d'études spécialisées exploitent des programmes d'enseignement bien rodés. Le dernier chapitre de l'ouvrage de W.P. Adams (1987) constitue un guide des universités s'intéressant aux populations nordiques.

Cependant il faut bien se rendre compte que, dans les Territoires et les provinces, les collèges locaux et les universités *ne sont pas les seuls* organes d'enseignement post-secondaire. Arctic Co-operatives Ltd., par exemple, exploite un programme bien rodé de formation à la gestion dans les T. N.-O. (voir B. Lyall, 1987) de même que l'Inuit Nunasi Corporation (A. Tunraluk, 1987). Il existe aussi toute une gamme d'établissements nordiques plus ou moins indépendants, tels l'Institut culturel inuit d'Eskimo Point, T. N.-O. (M. Shouldice, 1987) et le Centre de recherches de Kuujjuaq de la Makivik Corporation (W.B. Kemp, 1987) qui mettent sur pied des programmes d'enseignement. Même dans les Territoires, les universités «méridionales» exploitent des programmes importants de formation diplômée *sur place*, tels le programme de formation des enseignants de l'Arctique oriental mis en oeuvre par l'Université McGill à Iqaluit (J. Cram, 1987, et D. Wilman, 1987), et celui que l'Université Mémorial exploite par le truchement de l'Institut du Labrador à Goose Bay, au Labrador. Quant à l'Université de la Colombie-Britannique, elle a un corps professoral enseignant à Whitehorse, au Yukon (J.C. Yerbury, 1987).

De telles activités universitaires sont habituelles dans les régions septentrionales des provinces

"Inter-Universities North", (Blanar and Simand, 1987) but with the development of fully fledged universities only in northern Ontario and Quebec.

One section of Adams (1987) is devoted to Distance Education, a term which, in the North, refers *mainly* to situations in which students deal with their professors at a distance. The courses concerned range from traditional correspondence courses through courses based on audio and visual tapes to programs based on satellite communications. Every province in Canada, and most Canadian universities, are involved in Distance Education. Many of the programs concerned are accessible from the North although advantages may not be so great as they first appear (see Smith 1987). Athabasca University, in Alberta, specializes in this form of education and has a substantial presence in the North (see Owen 1977). A consortium of the universities of British Columbia has a well developed program which reaches through the Yukon into the NWT (Yerbury 1987). As articles in this book attest (e.g. Croft), the northern parts of Quebec and Ontario are well covered by programs of this sort.

It is interesting to place this activity, much of it very recent, within the context of recommendations of the Report of the Commission on Canadian Studies (Symons 1975). The Commission devoted considerable attention to the North. At one point (Symons, 1975, p. 150), the Commission recommended that:

> "serious consideration be given to the establishment of the nucleus of a university in the North. In making this recommendation, the Commission does not have in mind the instant creation of a university with an extensive physical plant. Nor does it propose that such a university should necessarily be planned in the

(comme «Inter-Universities North», programme nordique organisé par les universités du Manitoba — voir M. Blanar et B. Simand, 1987), mais seuls l'Ontario et le Québec ont des universités médionordiques à enseignement complet.

Un chapitre de l'ouvrage de W.P. Adams (1987) est consacré à l'enseignement à distance, expression qui, dans le Nord canadien, qualifie *surtout* l'enseignement donné par des professeurs à des étudiants éloignés géographiquement. Cet enseignement va des cours par correspondance habituels aux cours sur cassettes audio-visuelles et à ceux transmis par satellite de télécommunications. Chaque province canadienne, et la plupart des universités de notre pays, s'occupent d'enseignement à distance. Les nombreux programmes correspondants peuvent être suivis dans le Nord, mais leurs avantages ne sont pas aussi grands qu'ils paraissent au premier abord (voir L. Smith, 1987). L'Université de l'Athabasca, en Alberta, se spécialise dans ce type de formation, et elle a une clientèle importante dans le Nord (voir M. Owen, 1987). Un groupe d'universités de Colombie-Britannique a mis en oeuvre un programme d'enseignement bien conçu, qui touche une clientèle résidant dans le Yukon et les T. N.-O. (J.C. Yerbury, 1987). Comme certains textes du Compte-rendu le montrent bien (p. ex. celui de M. Croft), les populations du Nouveau-Québec et de l'Ontario septentrional sont bien servies par des programmes similaires.

On a interêt à considérer ces activités, dont certaines sont très récentes, à la lumière des recommandations du rapport publié par la Commission des Études canadiennes (T.H.B. Symons, 1975). Cette Commission a accordé une attention particulière au Nord canadien. A un moment donné (op. cit., p. 150) la Commission a recommandé que:

> «Il faudrait prendre sérieusement en considération la mise en place des éléments premiers d'une université dans le Nord du pays. En faisant cette recommandation, la Commission n'envisage pas la création immédiate d'une université dotée d'un complexe universitaire important. Elle ne propose pas non plus que cette université prenne la forme traditionnelle, et copie l'organisation des

traditional form and pattern of such institutions in the South. The commission is suggesting that now is the time to establish in the North, on a permanent basis, a limited university programme of teaching and research adapted to meet the distinctive needs of the region. The programme, for example, should serve and give expression to the cultures of the original peoples of the North, in addition to providing a base for teaching and study relating to other northern needs and circumstances. The emphasis in the planning for such a university nucleus might well be on an imaginative and extensive use of the technology of communications. It is clear that, through the exploitation of natural resources, substantial wealth is about to be removed from the North. It seems reasonable and prudent, that some small part of this wealth be tapped to serve the long-term educational requirements of those living in this region.

Against this, it will be argued that there is not yet the population in the North to support such an institution. However, such arguments were also used some sixty years ago by those who thought then that it was nonsense to establish the nucleus of a university in Alaska. In retrospect, it seems clear that the right decision was taken by those who looked beyond these arguments and proceeded to lay the foundations for a University of Alaska in 1917. The fact that the nucleus of this University was established then, when the population of Alaska was similar to the present population of Canada's northern territories, meant that it could grow with the State, responding to its needs, and playing a vital role in its development.

u iversités méridionales. La Commission souligne plutôt que le temps est venu de mettre en place, dans le Nord, un programme permanent, mais limité, d'enseignement et de recherche universitaires, conçu pour satisfaire les besoins particuliers de cette région. Ce programme, par exemple, devrait servir les peuples autochtones du Nord et mettre en évidence leurs cultures, en plus de fournir le cadre de l'enseignement et des études concernant les autres besoins du Nord et les conditions locales.

Lors de la conception de ces éléments premiers de l'université, il faudrait mettre l'accent sur une utilisation étendue et imaginative des techniques de télécommunications. Il est évident que l'exploitation des ressources naturelles du Nord canadien lui soustraira d'amples richesses. Il paraît donc prudent et raisonnable de consacrer une petite partie de celles-ci aux besoins à longue échéance des populations de cette région sur le plan de l'éducation.

A l'inverse, on pourrait soutenir que la population nordique n'est pas encore assez nombreuse pour faire vivre un tel établissement. Mais un tel argument a été déjà utilisé, il y a soixante ans, par les opposants à la création de l'Université de l'Alaska, qu'ils considéraient comme déraisonnable. Expérience faite, il est évident qu'en 1917 les responsables, ayant rejeté cet argument, ont pris la bonne décision en jetant les fondations de l'Université de l'Alaska. Comme la population de cette région était à cette époque fort semblable à la population des Territoires nordiques du Canada, il est évident que cette Université s'est développée parallèlement à la croissance démographique de cet État, a répondu à ses besoins et a joué un rôle capital dans son développement économique.

En outre, la Commission a recommandé que, comme première étape vers l'établissement d'une université boréale, une ou deux universités plus au Sud mettent en place des services de formation des adultes dans quelques-unes des localités

> In addition, and perhaps as an immediate step towards the eventual establishment of a university in the North, the Commission recommends that one or two universities open extension departments in some of the far northern communities, to help provide their inhabitants with learning and training opportunities not otherwise accessible to them.''

As careful reading of this indicates, there have been many changes since the mid 1970's. Canada still does not have one 'University of the Arctic'[1] but she has clearly moved much closer to meeting northern needs in higher education and research (not discussed here) during the last decade.

ACUNS is an organization of 35 Canadian universities which have a special interest in Northern Studies. It was established a decade ago in response to concerns such as those in Symons (1975). As neither of Canada's Territories has a university, it follows that all of ACUNS' member institutions are based in 'the south', in this particular sense, operating under the jurisdiction of nine of the ten Provinces. There are, strictly speaking, no federal universities in Canada (see Gillmore and Giberson, 1987). ACUNS is trying to assist the Territories, as well as the Provincial Norths, to develop higher education until such time that all have indigenous university programs like those in northern Ontario and Quebec.

[1] In 1971, the federal Minister of Consumer and Corporate Affairs issued Letters Patent for an institution to be known as the University of Canada North. In November of that year, a ''Concepts Conference'' was organized in Inuvik, NWT, by those involved with this venture. The idea of such an institution is also addressed in Science Council (1977).

> de l'Extrême-Nord, afin de fournir à leurs habitants les possibilités de formation et d'éducation qui autrement leur seraient inaccessibles.''

Comme la lecture soigneuse de ce texte le montre bien, de nombreux changements se sont produits depuis les environs de 1975. Le Canada n'a toujours pas d'«Université de l'Arctique»[1], mais il est évident qu'au cours des dix dernières années on a fait de vastes efforts pour satisfaire les besoins des populations nordiques sur le plan de l'éducation et sur celui de la recherche (domaine qui n'est pas examiné ici).

L'AUCEN est une association groupant 35 universités canadiennes qui accordent un intérêt particulier aux Études nordiques. Elle a été créée il y a dix ans pour répondre à des préoccupations semblables à celles de T.H.B. Symons (1975). Aucun des deux Territoires du Canada ne possédant d'université, il s'ensuit que toutes les universités membres de l'Association sont établies plus au Sud et relèvent de la compétence de neuf des dix provinces. Il n'existe pas, à proprement parler, d'université fédérale au Canada (voir A.K. Gillmore et M. Giberson, 1987). L'AUCEN s'efforce d'aider les Territoires, ainsi que les régions septentrionales des provinces, à y développer l'enseignement post-secondaire jusqu'au moment où tous disposeront de programmes universitaires internes comme ceux de l'Ontario septentrional et du Nouveau-Québec.

[1] En 1971, le Ministre fédéral de la Consommation et des Corporations a accordé des lettres patentes pour un établissement qui porterait le nom d'University of Canada North. En novembre de la même année, les promoteurs de cette entreprise organisèrent une Conférence sur ce thème à Inuvik, T. N.-O. Le Conseil des sciences a également considéré la nature d'un tel établissement (1977).

References and Bibliography

Adams, W.P. (ed) 1987. Education, Research, Information Systems and the North. ACUNS, Ottawa, 361 p. (hereinafter referred to as ACUNS 1987).

Blanar, M. and B. Simand 1987. Inter-universities North, Manitoba: "Bringing the university to you". *In:* ACUNS, 1987, 154-157.

Cleveland, M. 1987. Arctic College, the development of a Territorial college system. *In:* ACUNS, 1987, 95-99.

Cram, J. 1987. Northern teachers for northern schools: an Inuit teacher-training program. *In:* ACUNS, 1987, 116-123.

Croft, M. 1987. Distance education: a northern solution? *In:* ACUNS, 1987, 151-154.

Gillmore, A.K. and M. Giberson 1987. Canada's universities in context: AUCC and the "University System". *In:* ACUNS, 1987, 242-246.

Kemp, W.B. 1987. Makivik Research Department and the development of Inuit-based research and scientific education in Northern Quebec. *In:* ACUNS, 1987, 39-43.

Lyall, B. 1987. Arctic Co-operatives Limited — its role in northern education. *In:* ACUNS, 1987, 99-101.

Owen, M. 1987. Distance education: the northern panacea? *In:* ACUNS, 1987, 157-164.

Science Council of Canada 1977. Northward Looking, a strategy and a science policy for northern development, Ottawa, Report No. 26.

Shouldice, M. 1987. Inuit Silattuqsarvingat: a project of the Board of Directors of the Inuit Cultural Institute to establish a museum-based cultural teaching centre. *In:* ACUNS, 1987, 47-49.

Smith, L. 1987. Distance education must be good for us, because we sure got lots of distance. *In:* ACUNS, 1987, 146-149.

Stapleton, W.H. 1987. Challenge and change, the development of post-secondary education in the NWT. *In:* ACUNS, 1987, 92-95.

Symons, T.H.B. 1975. To Know Ourselves. The report of the Commission on Canadian Studies, Association of Universities & Colleges of Canada, Ottawa, 2 vols., 115 p.

Tunraluk, A. 1987. Managerial training in Nunasi Corporation. *In:* ACUNS, 1987, 101-103.

Wilman, D. 1987. Teacher training in the Canadian eastern arctic. *In:* ACUNS, 1987, 123-125.

Yerbury, J.C. 1987. The Open University Consortium of British Columbia: what are the implications of consortia for the Northwest Territories and the Yukon? *In:* ACUNS, 1987, 164-169.

Other useful sources for those interested in higher education in northern Canada are:

ACUNS 1983. List of northern specialists at Canadian universities/Liste des spécialistes du nord dans les universités canadiennes, 2nd Edition, Occasional Publication/Publication Occasionnelle No. 8, Ottawa, 211 p.

Greenaway, K.R. (Chair) 1972. Science and the North, a seminar on guidelines for scientific activities in northern Canada, Mont Gabriel, Quebec, Advisory Committee on Northern Development, Government of Canada, Ottawa, 287 p.

Kupsch, W.O. and M. Caillol 1973. The university and the Canadian North: inventory of classes, research and special projects, Ottawa.

Roots, E.F. et al 1987. Canada and Polar Science. Report submitted to the Minister of Indian Affairs and Northern Development, March, (Le Canada et la science polaire, Mars), 116 p.

Peter Adams
Douglas Parker

April 3, 1987

LAKEHEAD UNIVERSITY
Oliver Road
Thunder Bay, Ontario
P7B 5E1

(807) 343-8110

SPECIAL ROLE FOR CANADA'S NORTHERN UNIVERSITIES

Robert G. Rosehart
President
Lakehead University
Thunder Bay, Ontario, Canada

Most of the universities in Canada have developed in the very traditional mould; education, research and the stimulation, development and enhancement of knowledge. Such has been the spirit of development also of the newer northern universities in Ontario and Quebec. Developed during the past 20 years, these institutions initially have been moulded in very traditional form but an interesting physical and psychological transformation has beset them. They have identified unique roles that they may play in their respective northern regions. To some extent, this is surprising considering the "ivory tower on the hill" syndrome, the "town and gown" mentality, etc., but nevertheless, it has happened. Institutions have re-shaped their programs of study and research interests to better serve their particular regions. Some of these changes have been quite dramatic. At Lakehead, for example, over three quarters of the students are in professional, career-related, programs. This is a far cry from the "small" liberal arts image that some northern universities are tagged with.

Why has the above happened? I would say there have been two compelling forces — the first being that the continual underfunding of the Canadian universities has forced the northern universities to reach out for support and a mission. Secondly, the existence of the institutions for some 20 years has allowed time for them to "adjust" to their environments and we are now seeing educational and research thrusts that reflect these forces.

It is significant to reflect on a comparison of how the universities in northern Europe have developed (forced and/or allowed) in comparison to northern Canada. In Sweden and Norway, the development of northern universities has been a central cornerstone in regional development. At the same time, a considerable focus has been placed on professional education in the north including medicine and dentistry. We have recently looked very closely at the Swedish universities and feel that Canada could learn a lot from the Swedish experience. As a comparison, base funding of Lakehead and the University of Lulea in northern Sweden are very similar, but research support for a similar size, age, role institution is about 6 times higher in Sweden and a significant portion of such funding is targeted to regional issues and concerns, be they social, economic, technical or cultural.

The above is history. Where do we go in the future and what are the challenges?

i) Northern universities must continue to strengthen their community and business ties.

ii) Northern universities must work closer with their provincial governments particularly ministries of northern development as well as traditional post-secondary sector and strategic funding may be expected if proposed initiatives are realistic.

iii) Proponents of "northern studies" must delineate more clearly the scope of activities with particular encouragement for "people"-related, interdisciplinary activities.

iv) Northern institutional networking should be encouraged initially through co-operative summer school ventures.

v) Traditional university sectors should not see northern studies as a threat but rather an opportunity for their own disciplines' enhancement.

vi) A yearly meeting rotated around the northern universities should be held to maintain the present levels of enthusiasm and support.

Selected bibliography

D.M. Cameron, The Northern Dilemma: Public Policy and Post Secondary Education in Northern Ontario, Toronto: Ontario Economic Council, 1978.

Committee on University Education in Northeastern Ontario, Report (Harry C. Parrot, Chairman), Toronto: Ministry of Colleges and Universities, June 1983.

Lakehead University, Lakehead: The University of Northwestern Ontario, Thunder Bay: Lakehead University, August 1984 (submission to the Commission on the Future Development of the Universities of Ontario).

Lakehead University, Report of the Presidential Advisory Committee on Northern Studies, Thunder Bay: Lakehead University, 1985.

J.E. Lane, Creating the University of Norrland: Goals, Structures and Outcomes, Umea, CWK Gleerup, 1983.

J.K. McLarty, Organization of Higher Education for Improved Access, Equity and Spatial Justice in Primary Resource Regions: The Case of Northern Ontario, Canada. Ph.D. dissertation, Michigan State University, 1979.

Geoffrey R. Weller and Robert G. Rosehart, "Universities, Politics and Development in Northern Ontario and Northern Sweden: A Comparative Analysis" Canadian Journal of Higher Education, Vol. XV, No. 3, 1985, pp. 51–72.

Note

Steps have been taken, following the Sudbury meetings upon which this volume is based, to continue cooperation between the 'northern' universities (eds).

Lakehead University

UNIVERSITIES IN THE CIRCUMPOLAR NORTH: A COMPARATIVE ANALYSIS

Geoffrey R. Weller
Vice-President (Academic)
Lakehead University

Abstract: This paper compares the roles of the universities located in the northern regions of the various nations of the circumpolar north. Thus while the paper deals with the general role of universities in development it does so in the context of that role within underdeveloped regions of advanced nations. The paper begins by defining the area being discussed, the circumpolar north, and then delineating those characteristics of it that are relevant to an understanding of higher education. This is followed by an analysis of the different rationales that are evident for the introduction of university education in the circumpolar north. The problems faced by the northern universities are then discussed and comparisons and contrasts made. The paper then proceeds with an analysis of the policy outcomes of the process of university development in the region pointing to the successes and the failures. The paper concludes with an assessment of what the future holds for higher education in the circumpolar north.

Résumé: L'auteur compare les rôles assumés par les universités des régions nordiques dans les diverses nations circumpolaires. Il envisage leur action générale en matière de développement économique des régions sous-développées des nations évoluées. Son exposé commence par circonscrire la région à l'étude, soit la zone circumpolaire, en précisant ses caractéristiques importantes pour l'enseignement supérieur. L'auteur analyse alors les différentes raisons de la mise en oeuvre d'un enseignement supérieur dans la zone circumpolaire, puis examine les difficultés auxquelles se heurtent les universités nordiques. Il effectue ensuite des comparaisons et relève les contradictions, puis continue par une analyse des lignes de force choisies pour le développement des universités nordiques, en mettant en évidence leurs succès et leurs échecs. Il termine en esquissant les perspectives futures de l'enseignement supérieur dans la zone circumpolaire.

Introduction

In recent years there has been a growth of interest in what has become termed the circumpolar north. In large part this has been because of the increasing saliency of the region in the defensive and offensive strategies of the two superpowers.[1] Any major engagement between the two will take place largely in and across the circumpolar north. It has also been because of the steady northward movement of industry and population in a relentless search for natural resources.[2] These two developments have resulted in a number of problems that have also increased the level of awareness of, and interest in, the region. These problems relate to such things as the fragility of the environment and of indigenous populations to the incursions of industrial civilization, the type and pace of economic development and the range of social and cultural difficulties that arise when different cultures come into contact.

This paper deals with just one relatively limited but important aspect of what has resulted from the new saliency of the circumpolar north, namely the role of universities in the development of the region. Higher educational institutions are of relatively recent origin in most parts of the circumpolar north reflecting the newness of the development of those regions. The creation of universities reflects the degree to which that development has progressed in a relatively short time span. The establishment of universities could be construed as a signal of the permanency of the development and settlement and of the degree of commitment to those regions by central authorities. This paper, essentially, deals with a part of the more general subject of the role of universities in developing regions.[3] However in this case the developing regions are nearly all parts of more highly developed nations rather than distinct political entities in and of themselves.

The paper begins by defining the area being discussed, the circumpolar north, and then delineating those characteristics of it that are relevant to an understanding of higher education. This is followed by an analysis of the different rationales that are evident for the introduction of university education in the circumpolar north. The problems faced by the northern universities are then discussed and comparisons and contrasts made. The paper then proceeds with an analysis of the policy outcomes of the process of university development in the region pointing to the successes and the failures. The paper concludes with an assessment of what the future holds for higher education in the circumpolar north.

The circumpolar north

Universities and higher educational services are to some degree dependent upon geographic, social, economic and political conditions. Thus before dealing with higher educational matters per se it is important that these general factors are detailed. This is especially the case when the concept of the circumpolar north is not one that has been widely understood or accepted and when there is no clear definition of what exactly constitutes the region.

In very general terms the circumpolar north includes the northern parts of Canada, Finland, Sweden, Norway and the USSR as well as Greenland, Iceland and Alaska. Some definitions of the region are based on physical and climatic factors, others on human settlement patterns and still others on political boundaries.[4] This confusion mirrors that which exists in some of the constituent nations about where the north begins. By and large, political boundaries are the most useful ones for our purposes here. With Alaska, Greenland and Iceland, the political and physical boundaries are clear and need no explanation. In northern Scandinavia the northern part of each country is well recognized. In Finland it is the provinces of Lapland and Oulu. In Sweden it is the five northern counties of Norbotten, Vasterbotten, Jamtland, Vasternorrland and Gavleborg. In Norway it is the three northern counties of Nordland, Troms and Finnmark. Difficulties arise in the Canadian case. The two federal territories, the Yukon and Northwest Territories, have clear political boundaries. So do some of the northern regions of the provinces such as Quebec, Ontario, Manitoba, Saskatchewan and Alberta which all have, or had, agencies dealing with their provincial norths. However British Columbia does not delineate a 'northern' region and Labrador is defined more by geography than by politics. In addition there is little consciousness on the part of the general populations of most of the provinces over what exactly their northern regions consist of.[5] The biggest difficulty arises in the case of the USSR where there is no really accepted definition. Here the definition provided by Armstrong, Rogers and Rowley is used.[6] All of the Soviet north exists within just one of the fifteen

union republics, namely the Russian Soviet Federated Socialist Republic (RSFSR). Within the RSFSR, the north consists of three autonomous republics, the Karelskaya, Komi and Yakutskaya Autonomous Soviet-Socialist Republics (ASSR's) and ten territories (oblasts) and two provinces (krays). Within the oblasts and krays there are third order political boundaries called national districts of which there are seven within the northern oblasts and krays. These national districts, within the territories and provinces, have been created in recognition of the fact that there are a number of different minority peoples in the Soviet north.

A wide variety of universities exists in the circumpolar north. Alaska has the University of Alaska with its constituent campuses at Fairbanks, Anchorage and Juneau. Greenland has the Inuit Institute and Iceland the University of Iceland. In Finland there are two northern universities, one at Oulu and the other, the University of Lapland, at Rovaniemi. In northern Sweden there is the University of Umea and the University of Lulea along with two schools of Higher Education, at Ostersund and Sundsvall/Harnosand. There is one university in northern Norway, Tromso University. There are four universities in northern Canada. Laurentian University in Sudbury and Lakehead University in Thunder Bay are both in the province of Ontario and there are two effectively antonomous campuses of the University of Quebec, one at Chicoutimi and the other (the University of Quebec in Abitibi-Temiscamingue) at Rouyn. Memorial University of Newfoundland maintains the Labrador Institute of Northern Studies at Goose Bay, Labrador and while there are no universities in the Territories each has a college, Yukon College and Arctic College in the Northwest Territories. There are numerous universities within the northern USSR ranging from the relatively old and established ones at Novosibirsk and Irkutsk to newer, more northerly, ones such as Syktyvkar University in Syktyvkar in the Komi autonomous republic. In addition in 1957 the Soviet government established the Siberian branch of the USSR Academy of Sciences. The Siberian branch has most of its facilities at Akademgorodok near Novosibirsk but now has regional centres in Krasnoyarsk, Irkutsk, Tomsk, Yakutsk and Ulan-Ude. Scientific institutes in Vladivostok (not in the northern region), Magadan, Khabarovsk, Kamchatka and Sakhalin provide the core of the independent Far Eastern Science Center of the main academy of sciences.[7]

The land areas covered by the various parts of the circumpolar north and in which the northern universities exist, are enormous. The northern USSR covers approximately 10 million square kilometres while northern Canada covers approximately 7 million. Alaska has an area of 1.5 million square kilometres and Greenland, if the ice sheet is included, 2.2 million. The Scandinavian north covers 375 thousand square kilometres and Iceland 103.[8] To put these figures in perspective, Lakehead University's region, which is just one part of the northern region of one Canadian province, is as big as France.

There is a wide variation in the geology of these various parts of the circumpolar north. However, in North America the dominant feature is the Canadian Shield and Greenland is largely an extension of this formation. There are two Shield areas in the Eurasian north, the Baltic Shield and the Anaba Shield of north-central Siberia. These formations are rich in mineral resources which are the main non-defence related reason for the northward movement of the non-indigenous populations. These formations, however, are not suited to agriculture. The huge size and geology of the areas that make up the circumpolar north make it difficult to deliver university programs throughout them because of transportation and communications problems.

There is also a wide variation in the climates of the various parts of the circumpolar north. The interior continental areas are usually extremely cold. The coastal areas can be cold, as in the case of eastern Greenland and Labrador which are cooled by currents flowing south. The coastal areas can also be surprisingly warm, as in the case of northern Scandinavia and adjacent parts of the USSR which are warmed by currents flowing north. In general, precipitation is quite low, and some areas, such as the Keewatin zone of the Canadian Northwest Territories, are called Arctic deserts. Most of the area is within the permafrost zone and most of the area experiences periods of almost permanent light or permanent darkness. The harsh climate affects health, restricts agriculture and makes transportation and communications difficult.

The populations of the various parts of the circumpolar north are quite small, especially in relation to the area they occupy and to the southern populations of their respective nations. The northern parts of the USSR have a population in excess of 6 million while northern Canada has something over 1 million. Alaska has a population of 340,000 and Greenland 50,000. Northern Scandinavia has a population of roughly 1 million and Iceland just over 200,000. Most of these populations are very variegated both racially and ethnically. They are divided between the whites and the indigenous peoples with the proportion of indigenous peoples to whites being very low in some regions, such as northern Scandinavia, and relatively high in others, such as the far north of Canada. The proportions vary considerably by region within each nation of the circumpolar north. The non-indigenous populations are very divided ethnically in most parts of the circumpolar north, perhaps especially in Alaska and northern Canada. The indigenous peoples are very fragmented in all parts of the circumpolar north. In North America, there is a major division between Indians and Inuit and there are many divisions within each of these populations without even adding the Metis or half breeds and artificial divisions such as that between status and non-status Indians in Canada. Within the Soviet Union there are nearly twenty different northern native peoples ranging from very small groups such as the Aleuty, Eskimosy and Yukagiry, who number just a few hundreds or thousands, to much larger groups such as Komi, Yakuty and Karely who number in the hundreds of thousands. Such a divided population within each of the nations of the circumpolar north makes the delivery of university level education a very complex matter because of the number of linguistic, cultural and economic variations.

The geography and geology of the circumpolar north means that the population is mostly scattered in widely dispersed pockets. Large cities, that is cities with populations of several hundred thousands, are found only in the Soviet north. Most of the non-indigenous population lives in relatively small cities and towns located at resource development sites or along major transportation routes. Being largely resource-based, these communities are often not very stable, both in the sense that they experience a rapid turnover in population and in the sense that they are prone to rapid declines related to resource boom and bust. The indigenous populations in all parts of the circumpolar north are more widely spread than the non-indigenous populations and located in the smaller, more remote, communities. Some are still semi-nomadic. In most cases this scattered, divided and partially transient nature of the populations weakens regional consciousness and cohesiveness. It also makes it very difficult to deliver university level programming and complicates the operations of the northern universities in many ways.

Most parts of the circumpolar north have two completely different economies within each of them. The first is based upon resource exploitation in the form largely of mining, forestry, power generation and oil and gas exploration and development. Most of the non-indigenous populations of the circumpolar north are associated with this economy and most of the larger cities and towns have developed because of it. The second is the traditional economy based upon herding, hunting, fishing and trapping. Most of the indigenous populations of the circumpolar north are associated with this economy and it is linked with the smaller, more remote communities. Nowhere are the economies of the parts of the circumpolar north, coherent, integrated, regional ones. Not only are they internally divided but the resource sector is developed to meet the needs of southern regions. Moreover, there is little agriculture and little or no secondary manufacturing. A consequence of this is that the transportation networks are usually good for the movement of bulk commodities out of the regions but poor for internal purposes such as the delivery of higher educational services.

Political and administrative affairs are also deeply divided in the circumpolar north. In many of the nations of the region, universities are affected by complicated relations and sometimes overlapping responsibilities between national and sub-national (state, republic and provincial) governments. In addition, universities are often involved in complex relations between senior levels of government and local government structures, some of which are the result of moves toward greater control of functions such as education by indigenous populations. Finally, many individuals and groups in the various parts of the circumpolar north feel varying degrees of alienation and a sense of grievance because they think their hinterland regions are being exploited by the metropolitan centres of their respective nations which, in return, give little thought to balanced economic development, environmental protection or the delivery of social services such as higher education on an equitable basis with the south.[9]

Rationales for the introduction of university education

There was no single coherent plan for the introduction of universities in any of the nations of the circumpolar north. In all cases they grew up piecemeal and often as a result of local pressure. However, it is possible to distinguish two different rationales for placing universities in the north. One rationale was to meet the needs of northern populations for access to university education. The other rationale was to establish universities as instruments of the economic, social and cultural development of the regions in which they were placed. In many instances, universities were established with both rationales in mind but even where that was the case, one or other of the rationales tended to predominate. The two basic rationales are to a large degree linked with conceptions of the role that it is appropriate for universities to play in economic and social life and thus it is not surprising to find that those that tend to emphasize access are the North American universities and those that emphasize the economic and social objectives are the European and Soviet.

Canada's northern universities were largely established in the sixties and early seventies in an era when there was a massive expansion of most of the provincial university systems. Laurentian was founded in 1960, Lakehead in 1965, and the Université du Québec à Chicoutimi in 1973. The Université du Québec en Abitibi-Temiscaminque was formed much later, in 1983, but still on much the same approach. Although the University of Alaska was formed earlier in 1935 it expanded greatly in the sixties and seventies. These new institutions

and the expansion of the University of Alaska were the result of several factors but main among them was the goal of increased access to university education.

This sudden large growth was the result of several factors. In large part it was a response to the pressure of numbers resulting from the changing demographic profile of the population. It was also due to economists and others arguing that higher education was the fundamental key to increasing economic productivity and individual well-being. It was also thought by many at the time that the spread of higher education among a larger percentage of the population would help the causes of social justice and enhance equality of opportunity. It was, in fact, generally thought that a degree would markedly enhance social mobility for an individual and that improving accessibility would not only meet the rising expectations of individuals but enhance the prospects of individuals within various disadvantaged groups whether defined in terms of ethnicity, class, or region. In Canada, it was agreed that these benefits would only accrue if the universities were free of most state controls and were autonomous. Thus access and autonomy became key concepts and have remained so despite disillusionment with the promise held forth in the earlier era.[10]

The result of this attitude and approach was that the Canadian universities tended to be universities *in* the north rather than universities *for* the north. That is, they were intended to be access points to the wider university system for northern residents and to provide much the same kind of education as could be obtained at other universities of a similar size elsewhere. Thus the Canadian universities were really established for individuals in the north and not to help the region *per se* or ethnic groups within the region. They were not established as a consequence of any deep study or understanding of the problems of the north or how a university might help to tackle them. Thus they reflected both the individualistic ethic of the society, its dislike of indirect government intervention via the universities to tackle economic, social and cultural problems and also the general ignorance in many circles of conditions in the north.[11] There are several consequences of this approach that make the North American universities rather different from the European and Soviet.

One of these consequences was that the North American northern universities tended to embrace the traditional role of a university, namely that of disseminating knowledge, education and basic research. Not that this is an unworthy objective but, given the problems facing the northern regions, it could be construed as only a partial objective. Given the predominance of this traditional role, it is not surprising that the universities hired individuals to their academic staffs with no particular regard for their interest in or regard for the north. Indeed many of those hired in Ontario were not even from Canada. Most of them regarded research on, and other work related to, regional matters as parochial and likely to be at the expense of academic excellence or their career advancement. By hiring people essentially unconcerned with northern matters or problems, the universities entrenched the role originally given to them of being universities in rather than for the north, that is, of largely being access points.[12]

Another of the consequences was that the universities began with a relatively narrow range of programming. They disseminated knowledge and an understanding of a range of the basic Arts, Social Science and Science disciplines within the north. It is significant and symbolic that not one of the northern universities in North America, not even one as large as the University of Alaska, has a full medical school. All of the Scandinavian nations

have a medical school in their northern regions (Tromso, Umea and Oulu) as does the USSR. Given the relatively narrow range of programming, the North American universities were, and to some degree still are, largely training northern residents for out-migration since the range of job opportunities within the north, given its economic base, is very limited. The other major economic effect they had was to provide a stable employment base. The Canadian northern universities are located in relatively small cities where they are among the top employers.

Another consequence was that the Canadian northern universities have had comparatively minimal linkages with the regions and communities of which they are a part. Certainly the linkages are more limited than many had hoped would be the case. Yet another consequence was that the northern universities became subject to much the same kind of financing arrangements as all other universities and these were largely insensitive to most of the special needs of the north. Finally another consequence was that the northern universities became subject to the same regulatory arrangements as all the other universities and these, like the financing arrangements, exhibited only a limited sensibility to the problems of the north and the role the university could or should perform in a developing region.

Nearly all of the other universities in the circumpolar north were established on the basis of very different rationales from those behind the North American and especially Canadian northern universities. Outside of North America, while the goal of access to traditional higher education was a rationale it was not the predominant one. The overriding rationale, in nearly every case, seems to have been to establish institutions that would assist in wider development goals for a region or nation. Thus not only do they have the traditional roles but they have the newer roles of training appropriate professionals needed in the north to help regional economic, social and cultural development and to help cope with such things as environmental problems. In some cases, notably in Iceland and Greenland, the higher educational institutions could be said to have a nation-building role as well.

In nearly all cases the founding of the European and Soviet northern universities was linked with broad and conscious efforts at regional development based upon fairly detailed studies of conditions in the northern regions and what was needed to correct the difficulties revealed by the studies.[13] In some cases the motivation related largely to general economic development without any particular ethnic group development component as in the case of the northern Swedish universities while in others there was a conscious linkage to ethnic group development as in the case of the University of Lapland for the Lapps and Syktyvkar University for the Komi.[14] In most cases these regional development objectives have occurred in the post war period or have been emphasized in the post war period. This is clearly revealed in the founding dates of the universities. Umea and Lulea universities in Northern Sweden were established in 1963 and 1971 respectively. The University of Oulu and the University of Lapland in Rovaniemi were established in 1958 and 1979 respectively. The University of Tromso in northern Norway was established in 1968. The Soviet Union has given great emphasis in the post war period to the development of Siberia and the northern portion of the European part of the RSFSR. While some of the northern Soviet universities are relatively old, such as Irkutsk State University, which dates from 1918, most are post war creations such as Yakutsk State University (1956), Novosibirsk University (1959) and Syktyvkar University (1973). Moreover it has already been noted that the Siberian branch of the USSR Academy of Sciences was established in 1957 and has since developed a large network of regional centres.[15]

One of the consequences of this approach has been that the Scandinavian and Soviet northern universities are much more closely linked with state or national objectives and have been so since their founding. Thus the universities have embraced a dual role from their very beginnings often with emphasis initially upon the newer rather than the traditional roles. This implies less 'autonomy' in the Canadian sense of the term, but although there are some complaints about this fact it is not a particularly major problem anywhere. This could well be because the regional problems that the universities have to deal with are evident and recognized as important and give the universities a clear purpose and an ability to usefully contribute to society in very direct and practical ways. It could also be because the faculty members hired knew from the very outset that the universities had the newer roles and a northern outlook and, therefore, were not likely to resist or resent that fact.

Another consequence of having a dual role in the north has been that the Scandinavian and Soviet northern universities have a wider range of programming than the Canadian universities and even the branches of the University of Alaska, even though they are often no bigger. Many of the northern universities in Scandinavia and the Soviet Union began as technical institutions intended to supply professionals to serve the northern regions. Surveys and regional economic development plans typically identified shortages of specific types of manpower such as teachers, dentists, doctors, engineers, social workers and the like. The traditional disciplines tended to be relatively small aspects of the overall operations and, in some instances were not added until some time after the professional schools had been established, as in the case of the University of Umea in Sweden.[16] As remarked upon earlier, this wider range and more technical type of programming is symbolized by the fact that each of the Scandinavian nations and the Soviet Union has a medical school or schools in their northern region in contrast to Canada and the United States. Not only did the Scandinavian and Soviet northern universities begin with a wider range of programming, but they tended to consciously do a lot more research on northern problems than was the case at the Canadian universities, though perhaps not the University of Alaska.

Another result of the different role played by Scandinavian and Soviet northern universities is that, comparatively speaking, they have more extensive links with the communities of which they are a part. In some cases these are formalized through such devices as broadly representative regional boards for higher education as in the case of northern Sweden. Yet another result was that the northern universities were not as closely linked to the standard university financing system in that specific and clear regional development objectives required specific and clear special financing that exhibited a sensitivity to the particular needs of the region. Finally, another result was that the northern universities, although subject to much the same regulatory regimes, have been handled with a greater degree of understanding and sensitivity to special northern needs than has been the case in Canada.

The problems faced by the northern universities

The circumpolar universities, despite the differences in the rationales for their founding and operation, face a similar range of problems which, for the most part, arise from the common characteristics of most of the northern regions and their relations with the more developed southerly regions. These problems relate to the siting or location of the institutions, their relatively high cost of operation, the fragmented nature of the population they have to serve, the scattered distribution of that population, and their relationship with their respective wider university systems. Each of these will be discussed in turn.

Very clearly the locating of a university in a community is not only a symbol of that community's significance but an important positive factor for its future economic development. It is not surprising, therefore, that siting or locational considerations are a common problem throughout the circumpolar north. The locational problem was evident at the point of origin of most of the northern universities. There was often a lot of conflict between northern communities for the siting of the universities in their towns or cities. This was certainly the case in northern Ontario and in northern Sweden.[17] The inter-community conflict continued after the founding of the first set of universities and the general response has been to spread the facilities around the region either in the form of branch campuses, as in Alaska, branch institutes, as in the case of Siberian branch of the USSR Academy of Sciences, or semi-autonomous university colleges, as in the case of northeastern Ontario. It could be argued that the result has been, in some cases, a diffusion of effort, loss of a critical mass, coordination problems, and a few really odd situations such as the siting of a university college with fourteen professors and 100 full time students in a town with a population of only 5,500, namely the Collège Universitaire de Hearst in Hearst in northeastern Ontario.[18]

Another major problem for all the universities of the circumpolar north is the very much higher costs of even normal operation in a large, remote and climatically harsh region let alone the costs of undertaking the newer university roles related to development objectives. Distance from other universities, other centres of population and governmental centres means that travel costs and telephone costs are extremely high in comparison with most southern universities. This, of course, applies to academic activities such as faculty making conference paper presentations and administrative activities such as attending committee meetings in provincial/state or national capitals. Another aspect of this problem is that travel and communication within each of the regions is also usually extremely expensive and often difficult. Climate also imposes some unusually high costs on northern universities most obviously in terms of the cost of heating buildings. For example Lakehead University has a computer-controlled centralized heating system which has produced dramatic reductions in heating costs but still leaves Lakehead with the highest per square metre heating costs of any university in the province of Ontario.[19] The small size of many of the universities means that they tend to be high cost institutions when judged on a per capita basis and this is exacerbated where there is a dispersal of facilities around a region. A basic, and in many cases a more than basic, range of programs has to be maintained despite small numbers because of the regional development objectives that most have as part of their mandate.

Another problem faced by many of the universities in the circumpolar north is appropriate programming and research for the indigenous peoples within their region. In this regard there is a wide variation of attitude and approaches among the universities, probably reflecting the different levels of development and the different needs of widely varying types of indigenous peoples. At one extreme there is the Canadian case where there is little by way of a coordinated approach to the higher education of either Indians or Inuit and where it has only recently become a serious objective to try and train significant numbers of professionals to the higher levels. At the other extreme there is Syktyvkar University where 50% of its students are Komi and only 20% of the graduates work outside the Komi republic.[20] In many instances, and certainly in the North American cases, one of the problems is the adequate preparation of indigenous peoples for university level courses and the need to put on special transition courses where this is a problem. In many other

instances it is difficult to decide what the appropriate courses are that should be offered for the best result. Moreover there is often the problem of small numbers of people with widely varying language and cultural backgrounds that require specially tailored programs, clearly a high cost but necessary operation. In Alaska, for example, there are three major indigenous groups, Eskimo, Aleuts and Indians, and 20 different language groups.

Yet another problem faced by most of the circumpolar universities is the relatively small and dispersed nature of the populations that nearly all of them serve. The dispersed population, as previously noted, is a consequence of the geography and economy of northern regions. Most of the northern universities are located in relatively small cities and have to serve a few others of a not much smaller size and then a wide range of towns of a very much smaller size. The total population size of the northern regions is usually, when combined, large enough to warrant universities but it is this scattering that causes difficulties. As previously mentioned, one approach to dealing with this has been the location of branch campuses throughout some of the regions of the circumpolar north. The other approaches can be roughly divided into what could be termed education at a distance and distance education. Education at a distance refers to the sending of regular faculty members from the central campus to remote locations on a periodic basis. This is the approach that up until the present Lakehead University has adopted in regularly serving 17 or 18 off campus sites throughout northwestern Ontario. If only being delivered to relatively small numbers, it is an effective and popular method and not especially expensive when compared with distance education. Distance education refers to methods of instruction where the instructor is physically separate from the student. Perhaps the most extensive use of this method has been made at the University of Alaska with its LearnAlaska system which operates a state-wide satellite instructional television network that also utilizes audio conferencing, videotapes and mailings. While the system has generally been praised, it is extremely expensive to operate and has been criticised for having too few support services in the form of tutoring, access to library services and remedial teaching.[21] A third approach is beginning in northern Ontario where a recently announced distance education initiative will, it is hoped, supplement the education at a distance services already in place.

Another problem faced by some of the universities in the circumpolar north is competition for resources with universities in southern regions. This is not really a problem in Alaska, Greenland and Iceland where there is really only one institution within a clearly defined and separate political jurisdiction. One would suspect that the problem does exist within the USSR but the information with which to make any judgements is lacking. In Canada the problem clearly does exist and it poses serious difficulties for the northern universities. Any extension of special funding arrangements for Ontario's two northern universities clearly removes from the fixed pot available for all universities resources that might otherwise go to the southern institutions. Given the very constrained financial circumstances under which all of Ontario's universities have been operating for the past decade or more the southern institutions are not likely to be very sympathetic however worthy the northern case.

Policy outcomes

The usefulness of the universities in the circumpolar north can only properly be judged by comparing their relative policy outcomes. These outcomes clearly have to be related to the main rationales for their establishment, namely the degree to which they have helped

increase the supply of useful professionals in their respective regions, the degree to which they have enhanced access, and the degree to which they have undertaken useful research. There appears to be considerable variation throughout the circumpolar north in relation to policy outcomes; this is not surprising given the different rationales upon which they were established.

In terms of increasing the supply of needed professionals in northern regions most of those with a development rationale claim reasonable success. The University of Oulu is said to have more or less solved most of the serious shortages of academically qualified people from architects and engineers to doctors and teachers.[23] The first and most important reason for the establishment of the University of Umea was said to be to reduce the shortage of doctors.[24] This is why the dental and medical schools were the first units of the university to be established. This objective it is said has been achieved in that the university not only trains northerners who stay on in the north as doctors but attracts southerners who stay on for service in the north upon graduation.[25] The same success is claimed by Umea and Lulea for a range of other professionals such as teachers, engineers and social workers. The University of Tromso also claims a reasonable success in this role.[26] Details are not available for all the northern Soviet universities, but Syktyvkar University apparently only has 20% of its graduates working outside the Komi republic.[27] Those universities in the circumpolar north that did not have the development role but just the access role quite naturally have not had the same success as the others. In large part this is because they do not educate a number of the professionals produced by those with the development role. Most notably they do not train doctors and dentists. Thus the northern Canadian universities and the University of Alaska cannot claim any success in this regard. Consequently these northern areas are under-serviced and have to rely on all kinds of expensive incentives schemes to attract many of the doctors and dentists who do serve in their regions.[28] However, in those areas where they do train needed professionals, such as engineers and teachers, success can also be claimed in meeting regional need. Much of the success in this regard on the part of Lakehead and Laurentian universities is due to their own struggle to start up some of these professional programs after the establishment of the universities and the realization by the university authorities themselves that they were needed.

All of the circumpolar universities were established to enhance access to university education in northern regions and clearly all of them have had a marked effect in this regard. All of them claim that many students who might not have been able to attend university at all have now got that opportunity. Many argue that now they have been reasonably well established they are beginning to offer university education opportunities to those from southern regions as well.[29] Lakehead University now attracts somewhat over half of those students from its region that do go to university; this is a good percentage, given the relatively limited range of programs offered. Moreover, the university attracts approximately one half of its students from southern Ontario to its specialized degree programs. The University of Oulu in northern Finland claims a similar success and, in fact, it has been said on the basis of its success in training needed professionals and providing access that "the creation of the University of Oulu may be viewed as a measure which has been entirely successful, and one which is, and will continue to be in the future, of profound significance for regional development in northern Finland."[30]

What is not clear is the circumpolar universities' effect on access for northern indigenous peoples. In Canada the northern universities have had no special mission in this regard and have not yet made special efforts. The University of Alaska made special efforts to reach indigenous Alaskans with its distance delivery; however, less than 20% of distance delivery students are indigenous peoples and now the university has begun to encourage indigenous peoples to come to one of the university campuses. The success rate for indigenous peoples in Alaska has not been good. Of those that register, 80% drop out as freshmen and only 4% ever graduate. Poor educational preparation is only one of many problems that Alaskan indigenous peoples face; among the others are transition to big town or city life, transition to a university environment, financial aid problems, the frequent need to study part time and indecision over what they should take and what should be offered to them.[31] To some degree the indigenous Alaskans are beginning to try and tackle the problem themselves as the recent formation of the North Slope Higher Education Board and Centre indicates. This group, headquartered in Barrow, hopes to tailor things specifically for the needs of 9,000 people who live in the 88,000 square mile area. While the northern Scandinavian universities have made no direct effort in relation to access to the Lapps they do not have to face the same problems as in North America. It should be noted that they do, however, have a special concern for the preservation of the Lappish language and Lapp cultural traditions. The situation with regard to minority ethnic groups in the Soviet Union is clearly complex and while it can be determined that significant efforts have been made in some areas the information is not readily available upon which generalizations could be made.

In terms of promoting research in the regions of the circumpolar north, the record has also been a mixed one and one related to the differing rationales for the establishment of the northern universities. Not surprisingly in those universities that were established as access points in the north rather than development agents for the north the level of research on the north has been lower, in large part because there hasn't been the range or size of programs needed for much research. Thus the northern Canadian universities, while they have done what they can and while the amount of research is steadily increasing, have done relatively little. They have, of course, not been helped by the fact that there has, in general, been a lesser interest shown by governments in their regions. Thus there have not been the same number of governmentally-inspired enquiries for which research could have been of use. Those universities that were established as agents of development have had a greater capacity for conducting research; such research has been valued more by governments so it is not surprising that they have tended to do more. Nearly all of the specialized programs at these universities have research components. For example, all of the schools of medicine in northern Scandinavia make considerable efforts to study the special characteristics of health and disease in northern regions. In fact the University of Oulu has the Arctic Medical Research Institute located on its campus. While the precise dimensions of the northern research effort in the Soviet Union are not easy to determine, it is very clear given the range and size of the institutes and branches of the Siberian branch of the Academy of Sciences, that a major commitment has been made in a wide range of areas. The University of Alaska, especially the campus at Fairbanks, conducts quite extensive research in academic departments and in a large number of research institutes that focuses upon problems of the arctic and subarctic related to the environment, renewable and non-renewable resources, energy sources and the peoples of the north.

Conclusions

The record of the universities in the circumpolar north is such that there is cause for considerable optimism. Those that were established as instruments of both access to the wider university system and as instruments for the economic, social and cultural development of their respective regions have many accomplishments to which they can point after a relatively short time. Those that largely had the goal of enhancing access acccomplished that goal, and many of them have, of their own volition, begun to see the need to take on the additional role of being universities that aid general development. They may have an uphill battle to make governments see the wisdom of this route, but no doubt it will occur in time.

The high costs that have undeniably been involved in bringing university education to northern regions have probably been justified on many grounds. Regional equity has been enhanced, development has been assisted and much valuable research has been conducted. Where the universities have solved manpower supply problems their worth has probably most clearly been established, especially as it could be argued that the solving of this problem has offsetting factors such as eliminating the costs needed to attract, say, physicians to the north. There are, of course, benefits that do not have a monetary value easily ascribed to them. These are such things as the indication of seriousness of commitment to a region, the opportunity to enhance ethnic or racial group opportunities and to preserve and protect the cultural heritage of both regions and distinct peoples.

It is curious that given the similarities between the northern regions and the problems faced by the universities within them, there has been very little contact between the northern universities or discussion of common problems. It would seem likely that they would all benefit a great deal from exchanging information and maintaining regular contacts. Perhaps the Association of Canadian Universities for Northern Studies (ACUNS) might consider organizing an historic first meeting between all the circumpolar universities.

Notes

1. See Franklyn Griffiths, A Northern Foreign Policy, Toronto: Canadian Institute of International Affairs, 1979.
2. This process is described in T. Armstrong, G. Rogers and G. Rowley, The Circumpolar North, London: Methuen, 1978.
3. For a general discussion of the role of universities in developing countries see the Policy Studies Journal Vol. 14, No. 3, March 1986. This issue contains a special symposium entitled "Symposium on Developing Areas, Universities and Public Policy" edited by Fred Lazin, Samuel Aroni and Yehuda Gradus.
4. These issues are discussed in T. Armstrong, G. Rogers and G. Rowley, *op. cit.*, chp. 1.
5. For a brief discussion of Canadian northern boundary issues see Geoffrey R. Weller, "The Delivery of Health Services in the Canadian North", Journal of Canadian Studies, Vol. 16, No. 2 (Summer 1981), p. 69.
6. T. Armstrong, G. Rogers and G. Rowley, *op. cit.* chp. 2.
7. See Guri Marchuk, Science and Siberia, Moscow: Novosti Press Agency Publishing House, 1983, pp. 15-23.
8. These estimates are taken from T. Armstrong, G. Rogers and G. Rowley, *op. cit.*, pp. 280-282.

9. An example of the political patterns in northern hinterland regions can be found in Geoffrey R. Weller, "Political Disaffection in the Canadian Provincial North", Bulletin of Canadian Studies (U.K.), Vol. IX, No. 1, (Spring 1985), pp. 58-86 and Geoffrey R. Weller, "Hinterland Politics: The Case of Northwestern Ontario," Canadian Journal of Political Science, Vol. 10, No. 4, (December 1977), pp. 727–754.
10. See Geoffrey R. Weller, "The Decline of Canada's Universities: Fact or Fiction?" A paper presented at the annual meetings of the Western Social Science Association, Fort Worth, Texas, April 1985.
11. This point about ignorance of northern conditions is frequently made in Canada. Documentation of this sort of thing in Ontario can be found in Ontario Standing Committee on Procedural Affairs and Agencies Boards and Commissions, Report on Agencies Boards and Commissions (No. 11), Toronto: Legislative Assembly, 1st Session, 33rd Parliament, 34 Elizabeth II, pp. 3–6. It can also be found in Advisory Committee on Resource Dependent Communities in Northern Ontario, Final Report and Recommendations, Toronto: Ministry of Northern Development and Mines, 1986, p. 32 (recommendation 37).
12. See Geoffrey R. Weller, "Universities, Politics and Development: The Case of Northern Ontario". A paper presented at the International Symposium on the Role of Universities in Developing Areas, Ben Gurion University of the Negev, Beer Sheva, Israel, December 27–29th, 1983.
13. This point is made in relation to the northern Swedish case both in Jan-Erik Lane, Creating the University of Norrland: Goals, Structures and Outcomes, Umea: CWK Gleerup, 1983 and R. Premfors, "Analysis in Politics: The Regionalization of Swedish Higher Education", Comparative Education Review, 1984, pp. 85–104.
14. See Valentina Vityazeva, "Come back to our University" Soviet Life, August 1981, pp. 26–28.
15. See Valentin Koptyug, "A Bold Experiement A Quarter of a Century Old", Soviet Life, June 1983, pp. 22–27.
16. See Geoffrey R. Weller and Robert G. Rosehart, "Universities, Politics and Development in Northern Ontario and Northern Sweden: A Comparative Analysis", The Canadian Journal of Higher Education, Vol. XV, No. 3, (1985), pp. 51–72.
17. *Ibid*, pp. 62–64.
18. See Drouin, Paquin and Associates Ltd, Assessment of the Long-Term Viability of the Collège Universitaire de Hearst, Toronto: Ministry of Colleges and Universities, September 27th, 1982.
19. These types of higher costs were identified as being the real 'northern dilemma' by D.M. Cameron, The Northern Dilemma: Public Policy and Post-Secondary Education in Northern Ontario, Toronto: Ontario Economic Council, 1978.
20. Valentina Vityazeva, *op. cit.*
21. Peter Monaghan, "How Alaskans Use Communications Technology to Take Education to the 'Bush'", Chronicle of Higher Education, 7th May, 1986.
22. See Geoffrey R. Weller, "Universities, Politics and Development: The Case of Northern Ontario", *op.cit.*
23. Uuno Varjo and Marja-Leena Hultunen, The Founding of the University of Oulu and its Effects Upon Regional Development, Oulu: University of Oulu, 1977, (Acta Universitatis Ouluensis, Series A. Scientiae Rerum Naturaluim No. 50, Geographica No. 4).
24. See Jan Erik Lane, "Institutional Innovation and Implementation: The Case of Sweden", Policy Studies Journal, Vol. 14, No. 3, (March 1986), p. 472.

25. See Jan Erik Lane, "Higher Education Regionalization". Higher Education, Vol. 13, 1984, p. 366.
26. See The University of Tromso, The University of Tromso, brochure, no date.
27. Valentina Vityazeva, *op.cit.*
28. See Geoffrey R. Weller, "Health Care Delivery in the Canadian North: The Case of Northwestern Ontario". A paper presented at the annual meeting of the Western Association of Sociology and Anthropology, Thunder Bay, 13–15 February, 1986.
29. See Uuno Varjo and Marja-Leena Hultunen, *op.cit.*, p. 47.
30. Ibid.
31. See Peter Monaghan, "In Alaska's Vastness, Higher Education Reaches Those Who Hunt and Fish to Live", Chronicle of Higher Education, 7th May 1986.

UNIVERSITIES, POLITICS AND DEVELOPMENT IN NORTHERN ONTARIO AND NORTHERN SWEDEN: A COMPARATIVE ANALYSIS*

Geoffrey R. Weller
Vice-President, Academic and Professor of Political Studies
Lakehead University

Robert G. Rosehart
President
Lakehead University

Abstract: Both Ontario and Sweden established universities in their northern regions in the nineteen sixties. This article begins by noting that the two regions are similar in very many ways and that the pressures exerted in both for the establishment of postsecondary educational institutions were much the same. The article continues by comparing the rationales and principles upon which the two sets of universities were founded. It is indicated that while the principle of regional access dominated in northern Ontario the principle of regional service dominated in northern Sweden. Thus the northern Ontario universities began as small, basically undergraduate Arts and Science institutions while the universities in northern Sweden began as specialized professional institutes intended to solve specific regional problems and disparities. The article goes on to analyse the academic, financial and geographic problems faced by the two sets of northern universities since they were founded and the developments that have taken place. An assessment is

*Reprinted, with permission, from the Canadian Journal of Higher Education, XV, 3, 51–72.

then made of the successes and failures of the two systems and it is argued that although some convergence has taken place the Swedish approach has been the more successful of the two.

Résumé: L'Ontario et la Suède ont, parallèlement, créé des universités dans leurs régions du nord au cours des années soixante. Le présent article commence en mentionnant la similitude des deux régions, sous bien des aspects, tout comme celle des pressions exercées dans les deux cas, au sujet de la création d'instituts universitaires. Cet article se poursuit avec une comparaison entre les raisonnements et les principes sur lesquels les deux établissements universitaires furent fondés. Il est précisé que dans le nord de l'Ontario le principe prédominant était la difficulté d'accès au point de vue régional, alors que dans le nord de la Suède c'était le principe du service régional qui prédominait. C'est pourquoi les universités du nord de l'Ontario furent au début de petites institutions, préparant principalement à la licence d'arts et de sciences, alors que les universités du nord de la Suède furent dès le départ des établissements professionnels spécialisés, dont le but était de résoudre les problèmes et les disparités régionales spécifiques. L'article aborde ensuite l'analyse des problèmes académiques, financiers et géographiques que rencontrent les deux établissements universitaires depuis leur création, ainsi que les aménagements qui y ont été entrepris. Il fait ensuite état d'une évaluation des succès et des échecs concernant les deux systèmes et affirme que, malgré une certaine convergence, l'approche suédoise a été la plus fructueuse des deux.

Introduction

Ontario and Sweden are similar in many ways. Their populations are roughly the same as are the nature of their economies, geography and climate. Moreover, the northern regions of Sweden and Ontario are also similar. Both are large geographic areas in relation to the southern parts of their respective political jurisdictions. They have similar economies based upon natural resources. The major industries are forestry, mining, tourism and power generation. The standard of living as well as the social and cultural conditions of life are similar and, more importantly, significantly lower in each case than for the southern regions of the two political units. This has produced a similar political culture in which radical politics is particularly notable and in which there has been a relatively high degree of political unrest.

Both Sweden and Ontario established institutions of higher education in their northern regions at roughly the same time. Laurentian University was established in 1960 and Lakehead university in 1965. Laurentian has several small constituent colleges located at North Bay (Nipissing College), Hearst (Hearst College) and Sault Ste. Marie (Algoma College). A full university in Umea was established in 1963, a College or technical university in Lulea in 1977 and Schools of Higher Education in Ostersund, Sundsvall/Harnosand and Gavle/Sandviken in the same year. In most cases, the institutions established were in both northern Ontario and northern Sweden expansions of smaller more restricted pre-existing higher educational institutions.

The purpose of this paper is to see if there are any lessons that can be learned from a comparison of the two northern university systems. Essentially, use is being made of what in the literature on comparative politics is normally termed a 'most similar systems'

approach. The paper begins by comparing the nature of the two regions. This is followed by an analysis of the motivations for developing northern universities in the two regions. Then the many problems facing the two systems are compared. An analysis is then made of the various policy outcomes that have resulted from the establishment of the northern university system. Finally, an estimation is made of what the future is likely to hold for each system.

The regions compared

Both northern Sweden and northern Ontario cover large land areas and comprise a large percentage of the total for their respective jurisdictions. Northern Sweden, or Norrland, is made up of the five northern counties of Sweden — Norbotten, Vasterbotten, Jamtland, Vasternorrland and Gavleborg. These cover roughly 60% of the total land area of Sweden or 102,500 square miles. Northern Ontario consists of the area within the jurisdiction of the Ontario Ministry of Northern Affairs. It covers roughly 90% of Ontario's land mass or 370,000 square miles. The major cities and towns of both regions are widely scattered and located a long way from their respective capitals. Lulea is 618 miles from Stockholm and Thunder Bay is 1,000 miles from Toronto. These distances were magnified until recently in Ontario because ground transportation was not always easy and there was, in fact, no paved highway around the north of Lake Superior until 1965. (Lane, 1983, pp 25-29, Weller, 1983, pp 1-6).

Both northern Sweden and northern Ontario are located in areas that were heavily glaciated. The geology of both areas is rich in mineral resources but is such that it makes agriculture difficult on any significant scale, a fact only learned in northern Ontario after many unsuccessful attempts to settle the little agricultural land that was available. The climate of both regions is harsh which also mitigates against agricultural settlement. Both areas have cool summers and cold to very cold winters and a wide temperature range. Most of the land area of both regions is covered by forests but in northern Ontario, the northern third is above the tree line and consists of swampy lowlands bordering on Hudson's Bay.

While both northern Sweden and northern Ontario have large land areas their populations constitute small percentages of the total for their jurisdictions. Norrland has 18% of the total Swedish population or approximately 1.2 million out of 8.3 million. Northern Ontario has less than 10% with a population of 805,000 out of a provincial total of 8.2 million. In both cases the proportion of the total population is declining. The population of both areas is widely scattered and there are relatively few large population centres. None of the major centres in Norrland exceeds 100,000 with all of the major centres except Ostersund being spread along the Baltic Coast. Going from north to south the major centres are Lulea (67,000), Skelleftea (73,000), Umea (80,000), Harnosand (27,000), Sundsvall (94,000), Ostersund (55,000) and Gavle (87,000). Two of the major centres in northern Ontario exceed 100,000. They are Sudbury, the regional centre for Northeastern Ontario, with a population of over 150,000 and Thunder Bay, the regional centre for Northwestern Ontario, with a population of 112,000. Northeastern Ontario is the largest sub-region with a total population of 580,000 and a few cities of reasonable size including Timmins (45,000), Sault Ste. Marie (80,000) and North Bay (50,000). In Northwestern Ontario, Thunder Bay is the only city of any size at all with approximately half of the regions total population of 225,000. The other towns are widely scattered and very small with Kenora

being the largest at 12,000. Some of the more northerly communities, especially the native communities, are very small and extremely remote. The populations of many of the cities and towns have gone up and down with the boom and bust cycle of the primary industries upon which most are dependent.

The population of northern Ontario is more mixed racially, ethnically and in terms of religious conviction than is that of Norrland. While there are some 20,000 Lapps in Norrland they constitute a lesser percentage than the Indian population of northern Ontario. The Indian population constitutes approximately 10% of the total and consists of roughly one half status Indians and one half non-status Indians and Metis. The Indian population is quite rapidly expanding and is an increasing percentage of the regional total. The non-Indian population in northern Ontario is ethnically very mixed. The largest grouping is of British ancestry, with a very strong Scottish influence, but there is a very significant (30%) French Canadian population in Northeastern Ontario. There are significant percentages of people with Ukrainian, Scandinavian, Polish, German and Italian ancestry.

The economies of Norrland and northern Ontario are both resource based. The four big employers are the forest industries, mining, tourism and power generation. Mining and forestry are found all over Norrland while mining in northern Ontario is concentrated in the northeast and forestry in the northwest. Hydroelectric power generation is important in both Norrland and northern Ontario but the resources of Norrland (83% of the total hydroelectric power capacity of Sweden) is fully utilized whereas a little capacity remains in northern Ontario, although it would not be cheap to exploit. In both cases the natural resources of the region have been a big and vital component of the creation of wealth in Sweden and Ontario. Because of the need to export bulk commodities from Norrland and northern Ontario the transportation industry is also of importance. There are very few secondary manufacturing industries in Norrland or northern Ontario and, as has been observed, the agricultural sector is not a major part of either economy.

In both Norrland and northern Ontario, a traditional economy of hunting, fishing and trapping exists along with the resource exploitation economy but it involves a much more significant proportion of the population of northern Ontario than Norrland. The northern Ontario of the traditional economy is the remote native north of tiny scattered communities which is relatively far less affluent.

The geography of the regions and the nature of their economies have combined to create a lack of cohesiveness. Neither Norrland nor northern Ontario has an integrated, reasonably self-reliant, regional economy. The economies have been structured largely on the basis of the needs of southern regions. This is clearly reflected in the transportation networks which have historically been and are still largely structured to facilitate the movement of bulk commodities out of the region and, especially in northern Ontario, not for the purpose of intraregional communication. The lack of integration in the regional economy is partly due to the fact that most of the major industries are owned and controlled by groups headquartered outside the regions with, thereby, relatively little interest in developing integrated regional economies.

The nature of the economies of the regions, their population characteristics and lack of regional cohesiveness all clearly indicate that they are both hinterlands of their respective southern regions. This is also indicated by the relatively lower level of economic well-being and lower level of servicing in nearly all areas including, as we shall see, university

facilities. The differences between Norrland and southern Sweden are great and the residents of Norrland have traditionally been poor compared with those of southern Sweden even though recent decades have seen some improvement. The differences are also clearly noticeable in northern Ontario in terms not only of income but also of health, education and other services.

There is, therefore, an atmosphere in both Norrland and northern Ontario in which the local population feels exploited, underprivileged, alienated and unable to control either their own destiny or that of their respective regions. This has led to radical politics in both areas. The socialist vote has been stronger in Norrland than in southern Sweden and Norrbotten, Vasternorrland and Gavleborg have been strongholds of Swedish Communism. (Lane, 1983, p. 28) In northern Ontario, the social democratic New Democratic Party (NDP) has traditionally been strong and is the second party in the region. In addition, there have been occasional calls for the creation of a separate province of northern Ontario. While these calls have been distinctly 'fringe' they are of some significance. (Scott, 1975, Miller, 1980, Weller, 1977, Weller, 1980) Both Norrland and northern Ontario also have records of radical labour action. As Lane puts it "Norrland is well known for the only episode of industrial violence in the birth of the Swedish welfare society — the killing of four workers in Adalen in Vasternorrland". (Lane, 1983, p. 28)

The rationales for the introduction of university education

There was no single coherent plan for the introduction of higher education in either northern Sweden or northern Ontario. In both cases the systems grew up piecemeal and largely as the result of local pressures. The rationales for the initial creation of the two systems were, however, markedly different. In Norrland the arguments that were persuasive were nearly always practical in the sense of arguing the need for institutions of higher education to meet practical needs. In northern Ontario the arguments that were persuasive were nearly always related to the need for access to the general university system. In addition, the development of the university system in Norrland has been more closely linked with regional development plans. Thus, although the piecemeal nature and timing of the introduction of universities was similar in the two countries the nature of the insitutions established was quite different.

The major or persuasive rationales for the development of universities in Norrland were largely practical and based upon need. The event that sparked the agitation for a university to be located in northern Sweden appears to have been the 1929–31 investigations of health conditions in Norrland. (Lane, 1983, p. 125) As Rune Premfors states it "the study illustrated the staggering disparities that existed between that region and other parts of Sweden. An important reason for such difference was obviously the lack of medical doctors and dentists". (Premfors, 1984, p. 88) Regional and local interests thereafter pressured for local training institutions to be built. Initially, however, attempts were made to recruit doctors and dentists in the south for work in the north but this did not have particularly effective results.

In 1951, the government set up a commission to investigate the need for the expansion of the training of odontologists and, in 1953, the Commission recommended the establishment of dental training facilities at Umea. In 1957, the first students to be taught at the school (and at a school of Higher Education in Norrland) began their training. In 1956,

a commission into the training of doctors submitted a report which rejected the idea of a medical school being established in Norrland and argued that the existing medical schools should be expanded. Within a year, however, pressure from two members of the Riksdag from Umea and the Chancellor of the Universities as well as the Head of the Medical Board had succeeded in persuading the government to establish a medical school in Umea. The full training of both dentists and doctors did not, however, become established until 1965. Similar arguments related to need were made in relation to teaching and a school for the training of domestic science teachers was established in 1948, nursery school teachers in 1965 and general teachers in 1967. The same practical arguments were made concerning social work and a school for social work was created in 1962. (Lane, 1984)

However, considerations of access were not entirely absent from the decision to establish a University in Umea although even so access was thought of as being to subjects of practical use. In 1955, the government appointed a University Commission to investigate the likely expansion of demand, to plan expansion of the system, and to see if a university should be created in Norrland. The Commission recommended, in 1959, that the existing universities be expanded and no new university be created in Umea. The government, however, decided a university should be established and set up, in 1962, the Umea committee to plan a small university to concentrate on instruction largely in the sciences and social sciences with practical subjects such as the training of public administrators and economists being stressed. In 1963, the University of Umea began to operate. In 1964, the medical and dental schools were amalgamated with the university. In 1968, a Faculty of Arts was added. Finally, in 1977, the schools for the training of domestic science teachers, nursery school teachers, teachers and social workers were amalgamated with the University of Umea. (Lane, 1983, 47-64; Premfors, 1984)

The Swedish University system's expansion beyond Umea to Lulea also resulted from the paramountcy of the argument of practical need. There had been an expansion of technological higher education, in 1960, in response to increased demand with the expansion of the two existing schools of technology in Stockholm and Gothenburg (Chalmers Institute) and the addition of a third one at Lund. Demand continued to increase and consideration was thus given to the creation of further institutes. One was established in Linkoping in 1965. In 1966, the government appointed a commission (the so-called Norrland Commission) to come up with a proposal for an institute in Norrland. In 1969, the Commission reported and argued the need for an institute to stimulate economic development in the north. In 1971, the Lulea Institute of Technology was created. In 1977, all of the other training schools that had been established piecemeal (nursery school teachers in 1963, teachers training in 1968, music in 1977 and vocational training in 1976) were amalgamated with the Lulea Institute of Technology to form the College of Lulea. (Lane, 1983; Premfors, 1984)

The major or persuasive rationale for the development of universities in northern Ontario was that of access not of practical need related to regional development as in Norrland. There was very little questioning of the nature of the education or the type of institutions to which expanded access was now to be made possible. The northern universities, when established, were really seen as necessary only for more convenient access to the university system by those living in the northern regions of the province. It is not surprising, therefore, that they tended to be largely reflections of southern institutions in both their programming and structure. There was very little effort to make them northern in either

respect and there was certainly no conception that they might be used as one of the engines of regional development or to combat a regional undersupply of doctors, dentists, teachers, social workers or any other type of professionals. Perhaps this was because there had been no equivalent of the 1929 study of health conditions in Norrland that seemed to spark concern in that region. (Weller, 1983; Axelrod, 1982; McLarty, 1979)

A small Technical Institute was founded in Thunder Bay in 1945. When local pressure for its upgrading coincided with the large increase in potential enrolment in the 1960's it was duly transformed into a University in 1965. It thus became the regional access point for Northwestern Ontario. As has been indicated previously, there were no other towns of any size so there was really only one possible site.

A far more complicated situation existed in Northeastern Ontario because there were many more cities of a reasonable size and there were a number of institutions that wished to achieve full university status. One of these was the so-called University of Sudbury, a small catholic college, with (from 1959 on) an affiliated college in the tiny town of Hearst. Groups of businessmen in several centres were pushing hard for the establishment of universities in their communities and the Anglican and United Churches both wanted to establish universities in Sudbury. It was clear that Northeastern Ontario could not support six or seven independent universities so the government approved a compromise which did not solve the problem but did enable them to respond to popular pressure. A Laurentian University Act was passed in 1960 which allowed for the federation of church and non-church related bodies. This eventually led to a complicated structure which meant Laurentian University, as it became called, consisted of four colleges in Sudbury and three colleges in other communities. The colleges in Sudbury were University College (non-denominational), Univesity of Sudbury (Catholic), Huntington College (United Church) and Thorneloe College (Anglican). The affiliated colleges were the College de Hearst (Hearst), Algoma College (Sault Ste. Marie) and Nipissing College (North Bay). An added complication was that the new university was to reflect the linguistic split in the region between French and English by being a bilingual institution. While the denominational colleges in Sudbury now have only a small role in teaching and the Sudbury campus is essentially a united non-denominational institution, there is still some rivalry between the affiliated colleges and the main campus.

Sweden established an ad hoc commission in 1968, known as U68, which was to investigate the future regionalization of higher education in the country. 'Higher Education' was broadened to mean all postsecondary education. U68 proposed 14 towns or pairs of towns be designated as 'growth centres'. But a working party composed of Parliamentarians, appointed in 1974, proposed a much more elaborate framework for regional planning. It proposed six regions with a full university as its core and having a regional board to govern it. These six regions were accepted and established in 1975.

The university system was thus linked with the general goals of Swedish regional development policy. This policy was directed at achieving greater social equality by region, regional economic development, and a balance by region of public and private services. An attempt was made to limit the growth of the major metropolitan areas and create a number of alternative growth centres. In the early 1980's, a decision was even taken to relocate a number of government agencies. The 1968 Commission stated that "regionalization of the provision of higher education would effectively contribute to equality of participation, regional

economic development, a better study environment for students, and closer ties between those involved in higher education and the local community." (Premfors 1984, p. 95) Background studies indicated that higher education had the most positive effect on economic development of various different activities and a study of the effect of the founding of the University of Umea showed it had a wide ranging effect on the local economy, especially in terms of employment.

The plans for regionalization of the system of higher education had the support of the Social Democratic Party, the Center Party and the Communist Party. The Center Party was especially favourably disposed. Since these parties constituted a majority in the Rikstag it was clear the proposals for regionalization would be successful despite the opposition of the Conservative Party and many Liberals. The regionalization policy also had the support of two powerful national trade unions, the TCO (white collar) and the LO (blue collar). The Conservative Party and the Liberals argued that regionalization would add another layer of bureaucracy to the structure of higher education in Sweden. The established universities, rather naturally, opposed regionalization arguing it would thinly spread scarce resources and the new institutions would be second-rate since they would not have a real research base. (O.E.C.D. 1981, Premfors & Ostergren, 1978, Ministry of Education and Cultural Affairs, 1978)

In northern Ontario, the expansion of the university system in the 1960's was not, as in Sweden, connected with any clear regional development policy. There was a brief flirtation with 'regional' planning in Ontario but it was very vague and had little application to the north. (Department of Treasury and Economics, 1970, Department of Treasury, Economics and Intergovernmental Affairs, 1976, Ontario Economic Council, 1976) Very quickly, the government wished to avoid any reference to the terms. This was largely because it smacked too much of state intervention or 'socialistic' direction of the economy and society. There was not only a general desire not to interfere with 'natural' economic development forces, but also a desire to leave untouched major areas of social policy so that the dominant forces within each policy sector would be blamed rather than the government. This combination of capitalist ideology and a brokerage style of rule meant societal forces, especially organized interest groups, could penetrate the bureaucratic and political systems. (Wilson and Hoffman, 1972; Silcox, 1968; LeDuc and White, 1972)

As far as the Universities were concerned, this style of rule meant that universities were not seen as tools of social policy, certainly not regional development policy, except in the most general terms. Moreover, it meant a hands-off approach that was given the respectable rationalization of "autonomy" for the universities and 'non-interference' by government. The result was that when the great pressure for the expansion of universities was felt in the 1960's, that expansion came largely at the established universities and what new universities were established were largely the result of political accommodation rather than any logical plan either for the university system, or the economy, or the regions of the province.

Because of this all of the new institutions, including those in the north of Ontario, were seriously disadvantaged from their very births. In the first place, they were adversely affected by the fact that the goal for the system was simply "access" with little discussion of the nature of the education or the type of institutions to which expanded access was now to be made possible. As a consequence, the older established universities initially

kept nearly all of the professional faculties and research capacity and the newer universities, including the two northern universities, simply began as undergraduate arts and science institutions — a complete contrast to the beginnings of the universities in northern Sweden. In the second place, the two northern universities were adversely affected by being placed almost unprotected in what has been termed an "entrepreneurial university system" i.e. a competitive one. (Axelrod, 1982) This system resulted from the deliberate policy of the government not to establish a master plan for the universities, which might have included a clear and specific role for its northern components, but to leave them autonomous and to fund them accordingly. The trick of matching very large state funding with individual autonomy was achieved by a formula financing system tied to the number and level of students each university enrolled annually. This, of course, meant university incomes were determined by the number and type of students they could attract and this, inevitably, led to competition among the universities for students. In this competition, the two northern universities were seriously disadvantaged because they had little that was distinctive about them and they had far higher costs because of factors such as distance and climate.

It might be argued there could have been some kind of 'hidden agenda' in Ontario concerning the northern universities. Firstly, much of the politics in northern Ontario has been described as one of 'keeping the natives happy' but in fact doing very little to change the basic hinterland-metropolis relationship while making certain gestures or giving handouts to mitigate the worst effects of hinterland status. (Weller, 1977) The location of small, basically undergraduate universities in the north could be construed as part of this policy. Secondly, the establishment of Lakehead and Laurentian, with its affiliated colleges, may have been undertaken to prevent or mute intermittent political protest caused by the relatively unstable economies of most northern cities. In other words, they may simply have been reasonably useful ways of injecting public funds into the north to create a degree of economic stability in the larger centres. Universities certainly do have this effect. (Lakehead University, 1983) Finally, if one were quite cynical, yet a third reason could be seen for establishing small basically undergraduate universities without a northern focus in the north. This is that they help educate a youthful labour force for jobs that do not exist in the region thus creating the possibility of out-migration. If this mobility did not occur then either the unemployment rate in the north would be considerably higher than it is (with corresponding greater political protest) or the government would have to take more and wider ranging job creation measures than it has in the past. In short, the role originally envisaged for the universities in northern Ontario might have been to actually prevent calls for larger scale development rather than to act as agents of development. (Weller, 1977, p. 744)

The problems of the northern universities

The universities in northern Sweden and northern Ontario faced a wide range of problems in the first two decades of their existence. The geographical spread of postsecondary educational resources or the location of such resources was a continuing problem. There was also numerous difficulties that could be lumped together under the title "administrative". There was also a whole series of financial uncertainties. Moreover, each set of institutions has had problems in relating to the regions of which it is a part. Each of these sets or areas of difficulties will be dealt with in turn.

A major problem in both Sweden and Ontario has been the siting and the development of institutions in the various cities and towns in the north. In both cases, this produced some fierce political battles and some long-lasting problems. Jan-Erik Lane has detailed the inter-city rivalry in northern Sweden concerning the original location of the various institutions of higher education in that region. (Lane, 1983) He indicates that it was a very complicated political game in which Umea at first seemed to have all the successes but then suffered reversals. Umea was really first off the mark in pressuring Stockholm for a university and did far more by way of raising local funds and gaining political access for its claim than any other community in the north. With the changed attitude to higher education embodied in the 1977 general reforms and the linkage of higher education to broader plans for regional development, the claims of the other cities in Norrland were listened to and a technical university established in Lulea and smaller colleges at Ostersund and Sundsvall/Harnosand.

With the development of the Regional Board structure in Sweden, a device was put in place that had as one of its prime roles the distribution of higher education resources on a region-wide basis. The Northern Regional Board had broad representation from various social groups and from across the region. While this does not mean, of course, the elimination of problems, there is at least a mechanism in place for dealing with the issues and the central government does not have to become deeply involved in the process as has been the case in northern (especially Northeastern) Ontario.

The distribution of higher education resources around northern Ontario has only been a problem in Northeastern Ontario. Thunder Bay is the only town of any real size in Northwestern Ontario so it was the only logical location. However, in Northeastern Ontario the distribution/location problem has been deep and long-lasting and despite a great deal of analysis by various committees of inquiry the government appears hesitant to take any decisive action, presumably for fear of alienating some of the areas or, more particularly, the voters in some of the regions of Northeastern Ontario.

The Laurentian University federation created inter-campus rivalry at its very inception and even now "the institutions often see themselves as being in competition for students". (Ontario Council on University Affairs, 1983, p. 110) Moreover, it has been argued that "there is an unsatisfactory distribution of resources among the institutions and the off-campus programs offered by the institutions are not effectively coordinated." (Ontario Council on University Affairs, 1983, p. 110) The individual constituent campuses have each had their difficulties. The College de Hearst, for example, is located in a small community (5,000) and has had so few students (23 full-time and 500 part-time in 1982) that it has had continual and chronic financial problems. In 1982, the Ministry of Colleges and Universities commissioned an assessment of the long term viability of the College which recommended renewal of the institution be attempted. (Drouin, Paquin and Associates Ltd., 1982) Algoma College, to take another example, has suffered from severe competition from Lake Superior College in Michigan, chronic financial difficulties and lots of internal disputes. Algoma's problems were so great that a Royal Commission of Inquiry, the Whiteside Commission, recommended that the College be closed. (Royal Commission of Inquiry into Algoma University College, 1977)

In *The Ontario University System: A Statement of Issues*, which was published in 1978, the Ontario Council on University Affairs suggested that "Laurentian and its affiliated

university colleges might be integrated into a University of Northeastern Ontario". (Ontario Council on University Affairs, 1979, p. 34) The OCUA later established a committee of the four executive heads of the institutions chaired by an outsider, Dr. A.N. Bourns, to explore the options for structural change in Northeastern Ontario. In October 1981, the committee reported and recommended that a single University of Northeastern Ontario be established. (Ontario Council on University Affairs, 1981) After discussions with the various institutions in the region during which Laurentian and Algoma indicated their support and Nipissing and Hearst their opposition, the OCUA recommended to the government that such a new university be created. In October 1982, the government announced that it accepted the principle of restructuring the university system in Northeastern Ontario. (Stephenson, 1982) At the same time, the government announced that it was establishing a committee (the Parrott Committee) to recommend a structure and a name for the new university. On June 29th, 1983, the Parrott Committee reported, indicating it recommended the name Champlain University and the merging of the four existing institutions into one with a single Board of Governors and Senate and one President. (Committee on University Education in Northeastern Ontario, 1983) The Minister of Colleges and Universities, Dr. Bette Stephenson, while awaiting a study on start up costs for the new university, chose to refer the whole contentious matter to a new inquiry into the entire provincial university system (the Bovey Commission) that was established in 1984. To a large degree, the Bovey Commission dodged the issue and simply recommended that two advisory boards, one for the Northeast and one for the Northwest be established. (Commission on the Future Development of the Universities of Ontario, 1984, p. 43) New efforts are now being made by the heads of all the constituent units to redefine the whole relationship.

In terms of administration the two northern universities would at first sight appear to be under completely different regimes. In Sweden there is little autonomy, university employees are civil servants with national pay scales, and there is a great deal of control by the bureaucratic and the political realms. In Ontario the universities are autonomous and there is relatively little by way of a controlling bureaucracy or political strata, at least at the undergraduate level. However, upon closer examination the influence of the central state is not as overburdening in Sweden as one might expect from the formal structures in existence while the 'autonomy' the universities ostensibly have in northern Ontario is somewhat restricted by the manner in which funding is manipulated by the bureaucracy and government.

As a result of the Swedish higher educational reforms of 1977, all the various forms of higher education were combined into an essentially uniform entity. The entire higher educational organisation has the same general rules for admission and all fundamental decisions are made at the central level with all forms of higher education being planned on uniform principles. Intake capacity is, for instance, centrally by subject area as is the distribution of that capacity by institution. It is the National Board of Universities and Colleges in Stockholm which has the responsibility for planning and coordination of higher education and research on a national scale. This pattern of administration is common in Sweden, namely that the responsible Ministry (in this case the Ministry of Education and Cultural Affairs) is relatively small while there are quite large semi-independent national agencies such as the National Board. Perhaps the key units of the Board are the five subject area Planning Committees (each with 18 members). (National Board of Universities and Colleges, 1984)

To a very large degree, the northern institutions of higher education in Sweden do not suffer from anything like the same financial problems as those in northern Ontario. In Sweden, educational and research funding is considered separately but both are essentially related to program or departmental criteria. Moreover, there are six Regional Boards, one of which covers the north, which have fairly substantial additional funds to pay for the delivery of things which meet regional needs. (Lund/Malmo Regional Board of Higher Education, 1984) In northern Ontario, educational and research funding is essentially linked and related to a formula that is enrolment driven. In addition, off campus programming is also related to the formula and although it is given extra weighting it has proven quite insufficient to meet actual costs of delivery. (Lakehead University, 1984, pp. 37-39 and pp. 76-77) In both cases, the universities are more or less free to spend the total monies they receive as a result of these different methods of calculation as they see fit. It should perhaps be noted that in both cases there has been fiscal restraint applied in recent years.

The dilemma of the northern Ontario universities in terms of financing is that they are linked to a system-wide, essentially enrolment driven, formula for the vast majority of their income. This means they are placed in a directly competitive situation for students with larger more established universities that are better able to compete for those students and develop a more judicious mix of those students to maximize what are known as Basic Income Units (BIU's). This is not a specifically northern dilemma, it is a dilemma for all of the newer and especially the smaller institutions established in the 1960's.

Cameron has mistakenly asserted that the "northern dilemma" - the higher operating costs of the northern universities in Ontario. He argues that "there is compelling evidence to suggest that per student overhead costs will be higher in the north regardless of the size of the institutions involved or the particular objectives of their educational programmes". (Cameron, 1978, p. 42) The two major causes of higher costs are climate and distance from the major metropolitan and governmental centres. This means higher costs for all goods and services especially such things as fuel, travel and telephone calls. Obviously, therefore, either disproportionate resources per capita have to be allocated to northern institutions or lower quality than in the south has to be accepted. If northern universities are regarded as instruments of social development that may have an economic return their higher costs may be justified easily. If, however, they are simply regarded as access points to the general university system, as seems to be the case in Ontario, these higher costs are more difficult to justify. Difficult or not, the government of Ontario has accepted since 1975/76 that special grants should be given to Lakehead and Laurentian. These northern grants have been pegged at 11% of the operating budgets of each of the two institutions. Thus Cameron's northern dilemma is largely fictitious.

Perhaps because the Swedish educational system is fairly tightly controlled by the state and the employees are civil servants there has been a deliberate effort made to make the voice of the regions felt in relation to higher education to counteract the possibility of overcentralization. Ironically, the result has been that the northern universities in Sweden are more closely linked to all regions in which they exist than is the case in northern Ontario where the universities are autonomous.

One device for linkage in both systems is the Governing Board of the University. They are not, however, strictly comparable because a Swedish University Board is more like a mixture of a Board and a Senate in Ontario. Nevertheless, a conscious effort is made

to ensure that the 1/3 Swedish governmental non-university appointees are representative of the major interest groups in the region. In the case of both Lakehead and Laurentian there is relatively little representation of the wider regions of which the universities are a part and the Boards have tended to become almost self-perpetuating cliques despite some governmental appointments.

A more important device for trying to balance regional and national interests in Sweden is that of the Regional Boards for Higher Education for which no equivalent exists in Ontario. Sweden is divided into six regional higher educational zones with one of the six full universities as its core and several other institutions. The Regional Board for northern Sweden has Umea as its core university with Lulea, Ostersund and Sundsvall/Harnosund as the peripheral institutions. The Regional Board is made up of 19 representatives of the region appointed by the government. Informally, the government appoints from nominees of the various political parties in rough accordance with their relative strength and attempts to ensure the representation of a wide selection of public interest groups. Five of the nineteen appointees come from the academic sector. One role of the Boards is to coordinate the activities of the various institutions in the region so that duplication may be avoided. Another role is to respond to regional initiatives and undertake programs or courses of particular relevance to the region. Roughly 12% of educational program monies are made available to the Regional Boards for the purpose of developing local study programming not included in the five major state controlled program areas. In general these Boards have had a rather passive role but on occasion they have mobilized regional support and pressure to be applied to either the central control bureaucracy, the UHA, or the Ministry of Education directly. Sometimes this pressue has been assisted by politicians from the region. (Lund/Malmo Regional Board of Higher Education, 1984)

Although no equivalent device exists in Ontario, it is interesting to note that Lakehead University suggested to the Bovey Commission that widely representative Regional Boards for Northwestern and Northeastern Ontario be established to advise the Ministry of Education on the special problems of the north. (Lakehead University, 1984, p. 143) This was done because it was thought the existing advisory body, the Ontario Council on University Affairs, was dominated by southern universities and interests that did not adequately take account of the special needs of the north.

Perhaps because of these structural differences the higher educational institutions in northern Sweden seem not to have been accused, as have their northern Ontario counterparts, of having poor community relations and not fully serving the interests of the region. Of course, in northern Ontario the universities are largely autonomous so if they do not serve regional interests it is seen as being their fault even if the hands of the universities are, in fact, tied by governmental funding formulae. In northern Sweden there is such tight control over core programming by the state that the state is clearly seen as the culprit not the university. In addition, non-core programming is at least influenced by Regional Boards of which the universities only comprise a part.

The relatively minimal incorporation of the northern universities into the wider northern Ontario society is not, however, only structural. They are, of course, relatively new and began with faculty who had not only little regional identification but little identification with Canada for there was a heavy reliance on imported American, British and other foreign academics. Because of this, and because they were originally undergraduate, non-research

institutions, they produced little research of applicability to the region. Moreover, because they were basically liberal arts and science in approach they initially produced few of the types of graduates needed by the region such as doctors, dentists, nurses, social workers, engineers or foresters. Only after much struggling have Lakehead and Laurentian reoriented their programming such that it is of greater regional relevance. However, the prospect of becoming a training ground for doctors and dentists seems as remote as ever it was, despite the need and despite the failure of other measures to solve the supply problem in the north.

Policy outcomes

The relative success of the two northern university systems can really only be properly judged by comparing policy outcomes. Here they will be compared on the basis of the degree to which they have helped to increase the supply of various types of professionals in their respective regions, the degree to which access to postsecondary education has been enhanced, and the degree to which useful research has been undertaken.

Perhaps the major success for the higher education system in Norrland has been its effect on the supply of specialists in the region. As was previously indicated, the first and perhaps most important reason for the establishment of higher education in northern Sweden was to reduce the shortage of doctors. Thus medical and dental schools were the first units to be established in the region. (Lane, 1984, p. 366) The Faculty of Medicine at Umea attracts students from all over Sweden but roughly one half come from Norrland. More than half of the graduating doctors stay in Norrland and fully 83% of those coming from Norrland stay in Norrland. It has been concluded there that:

> Firstly, the Faculty of Medicine at Umea attracts students from the south who stay for service in the north. Secondly, medical students coming from the north stay in Norrland when they have been trained at Umea. (Lane, 1984, p. 366)

While this is indeed so, there are still fewer doctors in the north than in the south where, as in Ontario, there is something of an oversupply. In the case of dentists, however, Lane states that "the findings indicate clearly that the dental training program has relieved the need for dentists in Norrland". (Lane, 1984, p. 366)

The contrast with northern Ontario in this respect is alarming. There is a serious doctor and dentist shortage in the north despite a large number of special programs intended to improve health service delivery in the region. Several of the southern medical schools operate, in effect, outreach programs in the north (primarily McMaster, The University of Western Ontario and The University of Toronto). The Ministry of Health operates a financial incentive scheme intended to attract family practitioners and dentists to remote areas and gives financial support for specialists' visits. The Ministry of Northern Affairs offers bursaries if students promise to practice in the north for a period after graduation and operates a fairly sophisticated air ambulance system. While all these programs have had some effect the situation is still bad and is rather reminiscent of the situation in northern Sweden prior to the establishment of the Faculty of Medicine at Umea.

In terms of technical personnel, the relative situation of nothern Ontario is better than it is in the medical field but still not as good as in Norrland. Lulea began as a technical

university deeply imbedded in the region which attempted to meet regional needs and to obtain governmental support for this objective. In this it has been very successful. Lane indicates that "more than half of the students who have graduated from the College of Lulea have stayed to work within Norrland". (Lane, 1984, p. 367) Moreover, he says Lulea has not only served existing industries but helped the establishment of new ones with ten new firms being created on the basis of innovations stemming from research at the College. (Lane, 1984, p. 367) Moreover, large companies from elsewhere have been attracted to Lulea as a site for new business, especially the computer and electronics industries.

The same claims cannot be made for Lakehead and Laurentian where it was actually a struggle to establish fully fledged engineering programs. Even once established they had great difficulties expanding to their full potential and have not yet done so. Part of the reason was internal to their own universities. Since these began as predominantly Arts and Science institutions the faculty tended to look on them as interlopers and as a threat. Another part of the reason was external in that there were no regional economic development plans on the part of the government of which they could become a vital part.

In other professional areas the record has been mixed. The need for social workers was realized eventually by the two universities in northern Ontario but they began their programmes very late in the day and with great difficulty and they are by no means fully established yet. Again there was both internal resistance from established programs and no real external governmental recognition of the need or a willingness to meet it. Once again in Sweden the need for social workers was seen early, resulted in schools of social work being among the first areas established, and led to the need being met far more adequately than in northern Ontario. No exact comparison can be made in the area of Forestry because this is the responsibility of the Ministry of Agriculture in Sweden and is entirely separate from the Norrland university structure. Lakehead is the only one of the two universities in northern Ontario with a School of Forestry (and one of only 5 in Canada) and it had an uphill battle, again both internal and external, to become established — though it has finally done so. In the realm of teacher training, the Faculties of Education at the two northern Ontario universities have had a comparable success with northern Sweden in meeting regional demand.

Another indication of success for the Swedish approach has been the higher capture rate of students from the region. It is likely that this has much to do with the wider range of programs offered in northern Sweden compared with northern Ontario. It also has something to do with the fact that many school counsellors in northern Ontario went to southern universities and advised their students to either go to their alma maters or the older, more prestigious, southern institutions with a wider range of undergraduate and especially graduate programs. Moreover, in a system where the student has to pay for the costs of living away from home, if one had to leave a smaller regional town one might as well by-pass the northern universities and go south for only a very marginally greater cost.

Another indication of the success of the Swedish approach has been in the area of research. Research was regarded as very important at Umea right from the very beginning and was given the strong emphasis it has at the other full universities in Sweden. (Ministry of Education and Cultural Affairs, 1982; National Board of Universities and Colleges, 1984) Umea as a consequence has a wide range of research staff, projects and money and has

a number of publication series. Umea also has a full set of graduate programs going all the way to the doctoral level. For a relatively small and new institution it has developed a notable reputation in the area of research and graduate programs both nationally and internationally. Lakehead and Laurentian universities on the other hand began as undergraduate institutions and had difficulty establishing research activities and attracting research money. As a consequence they have developed only a limited range and depth of graduate programs and neither university has a doctoral program. The two northern Ontario institutions are trying to reorient themselves but face difficulties resulting from the period of their formation, the system's perception of their role, and competition from the larger, more established and more conveniently located institution in southern Ontario.

Both systems, however, have had difficulty establishing a wide range of depth of regionally related research. Umea has probably done somewhat better for it has some regionally related chairs, including one in the Sami language, and has a generally deeper and more extensive research base from which to undertake regionally relevant activities. In addition, a Centre for Arctic Cultural Research has been established at Umea which conducts research on the whole circumpolar zone, including the arctic and boreal or sub-arctic regions. (Umea University, 1984) The Centre is, however, relatively recent and appears to be having some start-up difficulties. The northern Ontario universities were disadvantaged from the outset in terms of regionally relevant research because they were, as noted, created as undergraduate access points not graduate and research institutions and originally hired faculty accordingly. In addition, many of the faculty in the regionally sensitive subjects were often foreign and even if not were frequently concerned not to seem parochial by conducting regionally related research projects. However, attitudes are gradually changing and regionally related research has increased in volume. Laurentian has created the Centre of Mining and Mineral Exploration Research and Lakehead is considering a proposal for the establishment of a Centre for Northern Studies. (Lakehead University, 1985)

The future

Over the years in Norrland there has been a shift in emphasis from meeting just the need for specific types of manpower, such as doctors and dentists, to that of enhancing general access to the system. In addition, there has been an increasing desire for greater "autonomy" from state control and influence in its many forms. Yet at the same time there is still a desire to be of great use to the region of which the universities and colleges are a part as witnessed, for example, by the space related work at Kiruna, the Centek Foundation at Lulea and Uminova at Umea. It is also reflected in developments such as the founding of the Centre for Arctic Cultural Research at Umea.

Over the years in northern Ontario there has been a shift in emphasis from just providing northern access points to the general university system to trying to meet regional needs for specific types of manpower as well. Although large strides have been made, largely on the initiative of the regional institutions themselves, there are a few major steps to be taken, especially in the medical manpower field. While the two northern universities wish to maintain their autonomy, they are not at all unhappy with the Bovey Commission's suggestions that there be advisory University Committees for Northwestern and Northeastern Ontario and some form of direct funding from the Ontario Ministry of Northern Affairs which, in combination, might have much the same effect as the Regional Board

in northern Sweden. Both Lakehead and Laurentian universities are also keen to become more useful to their region. This is indicated by their joint Innovation North initiative which is intended to foster the commercialization of research and instructional innovations developed at the two institutions. It is also indicated by their increasing emphasis on northern related research and programming and their desire to expand this further, as with the proposal for a Centre for Northern Studies currently being discussed at Lakehead.

It would appear, therefore, that convergence has been taking place between the two systems and that this is what is likely to continue to occur. In the not-too-distant future the two systems, though originally based upon completely different rationales, may come to quite closely resemble each other in many ways.

Notes

1. The authors would like to thank the Senate Research Committee of Lakehead University whose support for another project indirectly aided the preparation of this paper.
2. The authors would like to thank many members of the Swedish higher education system for their assistance but especially Dr. Carl-Gustav Andren, Anders Skoglund, Leif Lindfors, Dr. A. Wessman, Dr. Ringborg, Dr. Par-Erik Back, Dr. Jan-Erik Lane, Svante Ersson, Dr. Gunnel Gustafsson, Kjell Lundmark and Ulf Wiberg. Dr. George Harrower, former President of Lakehead University and Dr. Douglas C. Nord of the University of Minnesota also provided much valuable information.

References

Axelrod, P. Scholars and Dollars: Politics, Economics and the Universities of Ontario, 1945–80. Toronto: University of Toronto Press, 1982.

Cameron, D.M. The Northern Dilemma: Public Policy and Postsecondary Education in Northern Ontario. Toronto: Ontario Economic Council, 1978.

Commission on the Future Development of the Universities of Ontario. Ontario Universities: Options and Futures. (Edmund C. Bovey, Chairman). Toronto: The Commission on the Future Development of the Universities of Ontario, December 1984.

Committee on University Education in Northeastern Ontario, Report. (Harry C. Parrott, Chairman). Toronto: Ministry of Colleges and Universities, June 1983.

Department of Treasury and Economics. Design for Development: Northwestern Ontario Region. Toronto: Queen's Printer, 1970.

Department of Treasury, Economic and Intergovernmental Affairs. Design for Development: Northeastern Ontario. Toronto: Department of Treasury, Economics and Intergovernmental Affairs, 1976.

Drouin, Paquin and Associates Ltd. Assessment of the Long Term Viability of the Collège Universitaire de Hearst. Toronto: Ministry of Colleges and Universities, September 1982.

Lakehead University. Press release on the Effect of Lakehead University on the Local Economy. Thunder Bay: Lakehead University, December 1983.

Lakehead University. Lakehead: The University of Northwestern Ontario. (Submission to the Commission on the Future Development of the Universities of Ontario). Thunder Bay: Lakehead University, 1984.

Lakehead University, Report of the Presidential Advisory Committee on Northern Studies. Thunder Bay: Lakehead University, 1985.

Lane, J.E. Creating the University of Norrland: Goals, Structures and Outcomes. Umea: CWK Gleerup, 1983.

Lane, J.E. Higher Education Regionalization. Higher Education, 1984, 13, 347–368.

LeDuc, L. & White, W.L. The Role of Opposition in a One Party Dominant System: The Case of Ontario, paper read at Canadian Political Science Association annual meeting. Montreal, June 1972.

Lund/Malmo Regional Board of Higher Education. Higher Education in Sweden: The Regional Boards. Lund: Lund/Malmo Regional Board of Higher Education, 1984.

McLarty, J.K. Organization of Higher Education for Improved Access, Equity and Spatial Justice in Primary Resource Regions: The Case of Northern Ontario, Canada, Ph.D. dissertation, Michigan State University, 1979.

Miller, T. Cabin Fever: The Province of Ontario and Its Norths, in D. MacDonald (ed.) Government and Politics of Ontario (2nd ed.) Toronto: Van Nostrand Reinhold, 1980, 227–244.

Ministry of Education and Cultural Affairs. The Reform of Higher Education. Stockholm: Ministry of Education and Cultural Affairs, 1978.

Ministry of Education and Cultural Affairs. Research in Sweden. Stockholm: Ministry of Education and Cultural Affairs, 1982.

National Board of Universities and Colleges. Looking at Learning: Higher Education and Research in Swedish Society. Stockholm: National Board of Universities and Colleges, 1984.

National Board of Universities and Colleges. The National Swedish Board of Universities and Colleges. Stockholm: National Board of Universities and Colleges, 1984.

National Board of Universities and Colleges. Higher Education and Research in Sweden 1984/1985. Stockholm: National Board of Universities and Colleges, 1984.

Ontario Council on University Affairs. The Ontario University System: A Statement of Issues. (Fifth Annual Report). Toronto: Ontario Council on University Affairs, 1979.

Ontario Council on University Affairs. A Proposal for Structural Change in the University System of Northeastern Ontario. Toronto: Ontario Council on University Affairs, 1981.

Ontario Council on University Affairs. Ninth Annual Report (1982–1983). Toronto: Ontario Council on University Affairs, 1983.

Ontario Economic Council. Northern Ontario Development. Toronto: Ontario Economic Council, 1976.

Organization for Economic Cooperation and Development. Educational Reforms in Sweden. Paris: O.E.C.D. 1981.

Premfors, R. Analysis in Politics: The Regionalization of Swedish Higher Education. Comparative Education Review, 1984, pp. 85–104.

Premfors, R. & Ostergren, B. Systems of Higher Education: Sweden. New York: International Council for Educational Development, 1978.

Royal Commission of Inquiry Into Algoma University College. Final Report. (Commissioner John H. Whiteside Q.C.) Toronto: Ministry of Colleges and Universities, 1977.

Scott, D. Northern Alienation, in D. MacDonald (ed.). Government and Politics of Ontario. Toronto: MacMillan, 1975, 235–248.

Silcox, P. Some Problems of Opposition Leadership in Ontario Provincial Politics, paper read at Fortieth annual meeting of the Canadian Political Science Association. Calgary, June 1968.

Stephenson, B. Statement by the Minister of Colleges and Universities on the Restructuring of the University System in Northeastern Ontario to the Legislature. Toronto, October 1982.

Umea University. Center for Arctic Cultural Research, Umea University. Umea: Umea University, 1984.

Weller, G.R. Hinterland Politics: The Case of Northwestern Ontario. Cana.'ian Journal of Political Science, 1977, 10(4), 727-754.

Weller, G.R. Resource Development in Northern Ontario: A Case Study in Hinterland Politics, in O.P. Dwivedi (ed.). Resources and the Environment: Policy Perspectives for Canada. Toronto: McClelland and Stewart, 1980, 243-269.

Weller, G.R. Universities, Politics and Development: The Case of Northern Ontario, paper read at the International Symposium on the Role of Universities in Developing Areas, Beer Sheva, Israel, December 1983.

Wilson, J.S. & Hoffman, D. Ontario: A Three Party System in Transition, in M. Robin (ed.) Canadian Provincial Politics: The Party Systems of the Ten Provinces. Scarborough: Prentice Hall, 1972.

LAKEHEAD UNIVERSITY AND NATIVE PEOPLE AN EMPHASIS ON NORTHWESTERN ONTARIO: RESEARCH, EDUCATION, COMMUNITY SERVICE

J. David Bates
Lakehead University

I Abstract: Lakehead University in Northwestern Ontario is located in a region where Native people form about ten percent of the population and Native languages and cultures are relatively well established. Recent activity on campus by a number of faculty, students, and administrators points to greater interest by the University in working with and for the Native people of the region. Work at the University in research and other scholarly work, education, and community service as they relate to the Native people of the region are described. The findings and recommendations of six campus reports on Native students, programs for Natives, and institutional planning on Native matters are synthesized.

Particular attention is paid to the provision of university education opportunities for Natives and to helping Natives make their communities and organizations work.

Attracting native students to the University involves such actions as (1) helping Native children see a university education as a reasonable possibility, (2) making the necessary

information readily available, (3) setting appropriate admission standards, (4) providing special programs, (5) providing alternatives to full-time attendance on campus, and (6) reducing the financial burden.

Supporting Native students in the University will include (1) continuing liaison with various Native groups and support agencies, (2) counselling and tutoring services, (3) assistance with accommodation needs, and (4) a Native social and cultural environment.

Teaching Native students should involve (1) programs providing suitable academic preparation where that is necessary, (2) inservice training for university instructors, and (3) a suitable balance between integrated and segregated courses.

In providing service to Native businesses, organizations, communities, and agencies, university faculty should become familiar with Native customs and values. The focus should be on helping Native groups find solutions to problems that will work in their situations, solutions which may be different than those that would be used in the circumstances in which most faculty and students usually work.

The paper concludes with a synthesis of what we have learned from previous experience and proposals for future directions and actions as the University seeks to establish a greater role in studying Native matters, educating Native people, and providing services for Native communities and organizations. Of particular importance is an awareness that simply graduating more Native students from universities is not enough: they should have learned how to find solutions to their problems in their social and cultural circumstances. Educating Native students in attitudes and methodologies that are not appropriate for them and their needs will be less than we can do and a disservice to them. A crucial need will be a faculty with knowledge, understanding, and appreciation of regional Native history, traditions and culture, and ways of thinking and learning. Effective communication and teaching skills, necessary in general to do our work well, will be even more important.

The potential costs and problems of assuming greater roles and responsibilities with respect to the Native people of Northwestern Ontario should suggest caution but should not deter the University from continuing with its intent to do so. It would be a better university as a result.

Résumé: L'Université Lakehead est située dans une région du Nord-ouest ontarien où les Amérindiens forment dix pour cent environ de la population et maintiennent assez bien les langues et les cultures indigènes. Les activités intro-universitaires récentes d'un certain nombre d'enseignants, d'étudiants et d'administrateurs montrent que l'Université s'efforce d'oeuvrer de concert avec les Autochtones de la région et à leur avantage. L'auteur décrit les travaux de recherche et d'érudition, les efforts d'enseignement et les services à la collectivité mis sur pied en faveur de cette population amérindienne. Il fait la synthèse des conclusions et des recommandations de six rapports universitaires concernant les étudiants autochtones, les programmes à vocation amérindienne et les efforts de planification universitaire pertinents.

L'auteur accorde une attention particulière aux possibilités que l'Université offre aux Autochtones désireux de s'instruire et à l'aide qu'elle leur fournit pour l'organisation et la vie sociale de leurs collectivités.

Pour attirer des étudiants autochtones, il faut, entre autres, que l'Université: 1) convainque les jeunes Autochtones qu'il leur est possible d'envisager une éducation universitaire; 2) rende très accessible l'information pertinente; 3) fixe des normes d'admission adéquates; 4) mette sur pied des programmes spéciaux; 5) prévoie d'autres modes de fréquentation universitaire que les études à plein temps, et 6) réduise le poids financier de ces études.

L'aide aux étudiants autochtones nécessitera que l'Université: 1) établisse des relations constantes avec les associations autochtones et les organisations d'aide; 2) mette en place des services d'orientation et des cours individuels; 3) aide à l'hébergement des étudiants, et 4) mette en place une infrastructure sociale et culturelle autochtone.

L'enseignement des étudiants autochtones devrait se fonder sur: 1) un enseignement propédeutique en cas de nécessité; 2) le perfectionnement des chargés de cours, et 3) un équilibre judicieux entre les cours suivis en commun et les cours ségrégés.

Le corps enseignant doit se familiariser avec les coutumes et l'échelle de valeurs amérindiennes pour fournir des services mieux adaptés aux entreprises, aux associations, aux collectivités et aux organismes autochtones. Il faut mettre l'accent sur l'aide aux Autochtones en s'efforçant de trouver des solutions fonctionnelles aux problèmes qui les préoccupent. Ces solutions peuvent être différentes de celles qui conviendraient dans le cadre habituel des activités des professeurs et des étudiants.

L'auteur conclut son exposé par une synthèse des leçons de l'expérience et des propositions d'orientation future de l'action de l'Université, à mesure que celle-ci développera l'étude des questions amérindiennes, l'effort de formation des Autochtones et la fourniture de services aux collectivités et aux associations indigènes. Soulignant qu'il ne suffit pas d'accroître le nombre des étudiants autochtones diplômés, il montre la nécessité de leur apprendre à trouver des solutions aux problèmes culturels et sociaux de leur collectivité, car ce serait leur rendre un mauvais service que de leur enseigner des attitudes et des méthodes qui ne conviennent à celle-ci. Il est capital que le corps enseignant connaisse l'histoire, les traditions et la culture amérindiennes, les comprenne et les apprécie, et perçoive les modes de pensée et d'apprentissage correspondants. Ce corps enseignant doit avoir des capacités de communication et d'enseignement lui permettant d'accomplir sa tâche de façon entièrement satisfaisante.

Les autorités universitaires doivent tenir compte des coûts éventuels et des difficultés de l'élargissement de leur rôle à l'égard des collectivités amérindiennes du Nord-ouest ontarien, sans se laisser dissuader de l'assumer: l'Université en sortira grandie.

2 Introduction

The purpose of this paper is to provide a review of Lakehead University's involvement with Native studies and Native matters and then to look into the near future for directions and actions that might be feasible. I have used the experiences of colleagues who have worked with Natives and on Native matters, conversations with Natives and Native Elders, discussions and reports of University committees concerned with Native matters, and my twenty years of working with and teaching Natives and of visiting native communities. In particular, I draw on six reports produced on campus in the last two years by

groups concerned with Native students and matters and the future directions of the University. This is the first synthesis of these reports and brings some of the issues into focus.

The paper begins with a description of the University's situation in Northwestern Ontario as it relates to the Native people of the region. The next four sections consider the work of the University in research and scholarly work related to Native matters, in providing educational opportunities for Natives, and in providing assistance to Natives in their work. The following section then discusses some proposals and implications for the University in the near future.

3 Northwestern Ontario

3.1 The region

Most of the region served by Lakehead University is Precambrian Shield covered with Boreal forest. In the south there is some Great Lakes-St. Lawrence forest and in the north there is the Hudson Bay Lowland and a transition from forest to barren land.

Northwestern Ontario includes the Districts of Thunder Bay, Kenora, and Rainy River. Its area is approximately 523 000 square kilometres, 57% of the area of the Province. North to south it is about 900 km and east to west about 700 km. The University also serves some communities in Algoma and Cochrane Districts. Most of the major communities are strung along the two east-west highways in the south, #11 and #17. Thunder Bay is centrally located with respect to east-west distances and other population centres but is at the very south of the region and thus quite distant from many of the Native communities in the north. Winnipeg, at 700 km and Sault Ste. Marie at 715 km are the closest Canadian cities, while Duluth (305 km) and Minneapolis (545 km) in Minnesota are the closest major centres. The two major remote Native communities, Big Trout Lake and Sandy Lake, are 600 km northwest of Thunder Bay. For comparison, Toronto to Montreal is 540 km. A series of small communities, many predominantly Native, are strung along the CNR mainline through Nakina, Sioux Lookout, and Minaki.

3.2 The people

There are fewer than 250 000 people in the region, and about half of them are in the city of Thunder Bay and the immediately surrounding area. Other communities in the southern part of the region are commonly an hour or more driving time apart and have populations of a few hundred to a few thousand.

Approximately 10% of the population of Northwestern Ontario is Native. The Native birth rate is higher than that of the rest of the population. A few of the southern communities have a significant Native population but most of the southern Native population resides in reserves accessible by road. North of the road system there are thirty or so remote Native communities with a population range of approximately 25–1200. Linguistically, Thunder Bay is strategically located in two ways. First, it is in the centre of a large area in which the Algonquian languages of Ojibwe and Cree are well-established. Second, around and south of Thunder Bay Ojibwe is generally used as the second language while further north it is generally the first language.

3.3 Communication

As mentioned above, distances are great in the region served by Lakehead University. The ease of communication between the University and the people in the outlying communities becomes important. Natives in the southern part of Northwestern Ontario are generally served by road, telephone, TV, and scheduled air service in a nearby community. The western part of the region traditionally communicates more with Winnipeg than Thunder Bay while the Fort Frances area is closer to Duluth, Minnesota than to Thunder Bay.

In Northwestern Ontario north of Red Lake, Sioux Lookout, and Nakina, there are no roads joining communities, and scheduled or charter air service is the main means of travel between these communities and communities in the southern part of the region. More all-season airstrips are being built in northern communities to provide an alternative to the still common use of float and ski equipped charter aircraft. Satellite TV and telephone are available in many of these communities although distribution within the community is often limited. Tele-health linkages are provided from five of the nursing stations in the Sioux Lookout zone and from the Sioux Lookout Zone Hospital to two hospitals in Toronto. Linkage with a Thunder Bay hospital is being discussed but not yet available. The Wa-wa-tay Native communication centre in Sioux Lookout has provided a Native radio service for much of the northern region and has begun a TV service.

There are no direct communication linkages between the University and Native communities other than that which can be provided by telephone and mail. [1]

4 University roles

Universities in general and Lakehead University in particular profess to three major functions: research and other scholarly work, teaching, and service to the profession and community. For Lakehead University the community includes many Natives and Native organizations and communities. Part of the University's resources should be and are being directed toward the Native people of Northwestern Ontario as

1. Research and other scholarly work — studying Native matters
2. Education — providing learning opportunities for Natives
3. Community Service — assisting Natives with their work and needs

Faculty have been involved in Native studies activities since the establishment of the University in 1965. The original activity was largely in Anthropology and Sociology. Since 1965 there have been greater and lesser efforts made to maintain northern studies committees advising the President. Native studies have been a consistent but relatively small interest compared to other northern studies. Currently there is a Presidential Advisory Committee on Northern Affairs which has made an effort to put a new focus on northern and Native studies.

5 Research and other scholarly work

There is no centralized or coordinated program at Lakehead University for studies of Native matters. The Chancellor Paterson Library includes a Northern Studies Collection containing materials related to Native matters.

5.1 Research related to Natives

Research and scholarly work on Native matters is conducted by about twelve faculty members at the University. Research activities are concentrated in northwestern Ontario. A recent survey of departments to obtain information for a report to ACUNS (Lakehead University, [1986]:20–24) and other inquiries showed that the major fields of study are

- aboriginal sites in northwestern Ontario, relationships between the people and the environment (Anthropology)
- current regional Native conditions, ethnology, and acculturation (Anthropology)
- Native telecommunications (Sociology)
- transportation (Economics)
- socio-demographic studies of Natives (Anthropology, Social Work)
- health care in Native communities (Nursing)
- Native language acquisition, syllabics phonebook (Languages, Education)
- Native literature (Education)
- Native education (Education)
- Native language education (Education)
- Native helping principles and systems of social service delivery (Social Work)
- social impact of resource development on Native communities (Social Work, Sociology)

6 Education

The most important role of the University with respect to Native people will be to help them obtain the education by which they can run their affairs and seek solutions to their problems. Lakehead University has provided some leadership in this area but there is much more that can be done.

6.1 Courses with a Native focus

Five departments in the University list courses in the calendar that involve studies of Natives, their communities, their culture, or their language. Most are offered regularly. Some have been offered for more than a decade and others are relatively new.

The Report of the Presidential Advisory Committee on Northern Studies recommends that more departments offer such courses (Lakehead University, 1985:29). Currently the following are offered:

Anthropology	courses on various aspects of Native people and cultures
Languages/Education	courses in Native American Linguistics, Algonquian and Iroquoian languages, Ojibwe, and Cree
Social Work	a course in Social Policy and Native People
Education	a Native Teacher Education Program and a Native Language Instructors Program
Nursing	a course in Transcultural Health Care.

6.2 Programs and courses for Natives

Through the Native Teacher Education Program and the Native Language Instructors Program of the Faculty of Education, Lakehead has had a major role in preparing Native teachers. Under the direction of the Dean, the Faculty of Education began the Native Teacher Education Program (NTEP) in 1974 and in 1981 introduced the Native Language Instructors Program (NLIP) [2]. The NTEP graduates Native students with a diploma and certification for primary/junior teaching in Ontario elementary schools. The current plan is to make the NTEP a four-year B.A.-B.Ed. program beginning in September 1987. The NLIP graduates students with diplomas in Native as a First Language (NAFL) and Native as a Second Language (NASL). A Ministry of Education Native Language Teacher Certification program (NLTC) for teachers of Native (Ojibwe or Cree) as a Second Language is also offered.

The School of Nursing is planning a program for Native nurses and the Social Work Department is considering ways to prepare Native social workers in its programs. Other Native students work in a variety of University programs. The Lakehead University Nishinabek Student Association (LUNSA) estimated that there were 125 Native students in full-time or part-time studies in 1985/86 (Lakehead University Nishinabek Student Association, 1986:1). Also, there were about 90 students registered in the Native Language Instructors Program in the summer of 1986.

Instruction in Native Languages is well established. For example, Ojibwe has been offered since 1981 at Year 1 and has just been expanded to Year 2. Demand and feasibility could permit us to offer Year 3. All students are non-speakers, about evenly split between Natives and non-Natives. The students integrate well. Instruction is offered for first language speakers in Algonquian and Iroquoian.

6.3 Native students on campus

Several studies have examined various aspects of educating Natives at Lakehead University. They addressed some of the problems of Native students and of the University in meeting the needs and interests of Native people. Cultural, educational, community, and lifestyle differences need to be taken into account. Although some Native students have obtained university diplomas and degrees without special programs and considerations, relatively few have done so. The route is often difficult. These studies indicate that if Lakehead University intends to provide more opportunities for Native students to obtain a university education then some special considerations and efforts are in order. See [3] for acronyms used later in this paper.

6.3:1 Attracting Native students

Attracting Native students to the University involves such actions as (1) helping Native children see a university education as a reasonable possibility, (2) making the necessary information readily available, (3) setting appropriate admission standards, (4) providing special programs, (5) providing alternatives to full-time attendance on campus, and (6) reducing the financial burden.

Promotion and recruitment: The successful recruitment of Native students will include establishing many contacts with Native leaders and organizations, preparation of promotional materials directed at Native circumstances and needs, sensitivity to Native characteristics and interests, use of Natives with experience and success to assist with University promotion and recruitment and as role models, and one or more Native staff members with responsibilities for promoting and recruiting. Most Natives do not yet think of a university education as one of their options. The University should be part of the efforts to change this common perception. Recruitment activities should be directed specifically at Native students in primary and secondary schools, at Natives previously enrolled in post-secondary institutions, and at those who would qualify as mature students. (NSC p. 24, EIN p. 20, 21, 27, LUNSA p. 4)

Career counselling: Information on university education based careers of potential interest to Natives and on those offered at Lakehead should be provided to teachers and guidance counsellors in elementary and secondary schools in northwestern Ontario and perhaps in other parts of Ontario and Manitoba. (NSC p. 24, EIN p. 28, LUNSA p. 4)

Calendar information: The University Calendar should contain a section describing the various programs, courses, and services of interest to Native students. (NSC p. 31)

Appropriate admission requirements: The education and life experience of Natives with university education aspirations and ability often differ significantly from most university applicants. Admission requirements should be sensitive to such differences and take them into account. While requirements that are not demanding enough have negative and undesirable implications, requirements that are too demanding prevent potentially successful students from gaining access to the education necessary to further their education and the advancement of Natives in general. Admission requirements to academic preparation courses for Native students to upgrade their education can be less demanding. Confederation College upgrading courses may also be utilized. (BS p. 70, NTEP p. 19, 44, EIN p. 23, 29)

Special programs: Programs that are designed especially for the needs of Native students and take into account their special circumstances are generally accepted as necessary. Experience with the Native Teacher Education Program indicates that these special programs should evolve and/or be phased out as the needs and circumstances of the Native students and communities change. While there is a desire by Natives to retain their identity, there is also a desire not to be segregated from the regular programs and courses unnecessarily and indefinitely. (BS p. 92, NTEP p. 44, 47, NSC p. 29)

Alternatives to full-time attendance: Program delivery through regional centres, by off-campus courses, by distance education, by co-operative education with appropriate institutions and organizations, with fewer and longer practicum placements, by short courses, by concentrating the on-campus time, and by appropriate distribution of on-campus sessions are some of the suggested ways to reduce the demands that full-time attendance in Thunder Bay place on mature students in particular and to make a university education more attractive and feasible. (NTEP p. 48, EIN p. 27)

Distance Education: Delivery of courses by remote methods such as correspondence courses, telephone transmission, or by satellite is possible and could be attractive to students

in remote communities. There would be considerable cost and effort to do so and particularly to do so effectively. Co-operative efforts by several universities and consultation with Native leaders would increase the possibility of effective courses and delivery at acceptable costs. Aside from the cost, there is some question about the educational value of high-tech delivery methods. (BC p. 76, 92, 96, NSC p. 29, NSLU p. 6)

Financial assistance: The University should recognize the often difficult financial burden Native students incur in obtaining a university education and establish scholarships and bursaries specifically for Natives. They often have families to support and often do not have the family resources and job opportunities of white students. In many instances families are separated while a member is at university. While the student may receive support from the federal government (Indian and Northern Affairs Canada) there is little or no support for the family. Financial support is especially important for non-status Indians and Metis who do not receive the support from Indian and Northern Affairs Canada (INAC) that status Indians receive. (NSC p. 26, EIN p. 25, 31)

On-campus employment: Some government programs for providing on-campus employment for Natives have been operated by the University in recent years. Such experience is another way to provide financial assistance for Natives and an orientation to the University. Participation in such programs is recommended. (NSC p. 25, 32)

6.3:2 Supporting Native students

Supporting Native students in the University will include (1) continuing liaison with various Native groups and support agencies, (2) counselling and tutoring services, (3) assistance with accommodation needs, and (4) a Native social and cultural environment.

Community liaison: Regular and effective liaison with Native communities, Native leaders, Indian and Northern Affairs Canada officials, schools where Native students attend, health and social service agencies, and others is considered an important part of establishing and maintaining understanding, support, and cooperation. (NTEP p. 49, NSC p. 24, LUNSA p. 5)

Counselling: Counselling has been an intrinsic and important part of the Native Education programs in the Faculty of Education. The NTEP Review reinforced the importance of this component of the Program. Similar counselling service was considered important by all the reports specifically addressing Native student issues. The Nishinabek Student report made detailed recommendations for a Native student counselling service with a Native counsellor. The value of a Native counsellor was supported in other reports. (NTEP p. 21, NSC p. 26, EIN p. 25, 31, LUNSA p. 2, 4–10)

Tutoring: The University should ensure that Native students know what tutoring services are available and what financial support for tutoring is available. (EIN p. 24, 30, LUNSA p. 2, 6)

Accommodation: Native students often have difficulty finding accommodation, particularly if they have their families with them. Discrimination undoubtedly exists. A Native residence on campus, particularly as part of a Native social and cultural centre, could provide some of the community that is so difficult for Native students to find. No attempt

to force a segregration of Native students is advised. Support in any form possible for Native off-campus housing ventures such as the Kashadaying Residence would benefit the Natives and the University. (NSC p. 27, NTEP p. 21, EIN p. 25, LUNSA p. 5)

Social and cultural: The social and cultural needs of Natives received attention. Removal from their Native cultural environment, adaptation to urban living, educational and family problems, and other stresses on Native students can be alleviated. A Native social and cultural centre, the presence on-campus of a Native Elder, orientation programs, peer assistance, mentors, a Native Student Council, and a Native residence were among the suggestions. A Native College and/or a Native social and cultural centre of some form would serve as a valuable focal point for Native students in particular and for the University's support of Natives and Native studies. (NTEP p. 49, NSC p. 12, 27, 28, EIN p. 24, 25, 30, LUNSA p. 5)

6.3:3 Teaching Native students

Teaching Native students should involve (1) programs providing suitable academic preparation where that is necessary, (2) inservice training for university instructors, and (3) a suitable balance between integrated and segregated courses.

Academic preparation: The varied and often relatively deficient educational backgrounds of Native students entering university require some upgrading opportunities. Students in the Native Teacher Education Program take a preliminary summer orientation program in English and Mathematics if that is considered necessary. Academic preparation courses, transition programs, remedial courses, or some other form of academic upgrading formed a part of many recommendations from the reports. Some of these should be suitable preparation for many University programs and need not be duplicated by different departments. (BS p. 69, NTEP p. 45, 47, NSC p. 28, EIN p. 22, 29)

Instructors: Some inservice training for instructors of Natives to familiarize them with Native history, communities, culture, needs, and learning characteristics was recommended. (NTEP p. 14, 49, EIN p. 24, 29, LUNSA p. 7)

Integrated or segregrated: Experience with the Native Teacher Education Program and the recommendations of the NTEP Review suggest that segregated programs should evolve toward some significant degree of integration. The best integration was seen as two-way, with Native students taking some of their courses in the main teacher education programs and non-Natives able to take courses in the Native teacher education programs. External perceptions that a segregated program is inferior, Indian and Northern Affairs Canada policies, internal costs of separate programs, and the academic and social advantages of integrating the Native students into the mainstream of university life must be weighed against the academic and cultural advantages of segregated programs and courses. (NTEP p. 24, 45)

7 Community service

In its submission to the Bovey Commission, Lakehead University stated that, as a university for the north, it "has a role that helps in promoting an understanding of Northwestern Ontario (and the Boreal Zone in general) within the region, provincially, nationally and internationally and which also assists in the actual development of the region", and listed

four broad areas of interest: (1) Social Development, (2) Economic and Political Development, (3) Renewable and Non-Renewable Resource Development, and (4) Cultural Development (Lakehead University, 1984:7–8). A role as a university for the north includes consideration of the interests of the Native people of Northwestern Ontario and ways in which they may be served.

7.1 Regional Native needs

Native people and their organizations and communities have needs that the University can serve. Native bands are assuming more responsibility for managing their communities, schools, social services, cultural, and political organizations. They enter into enterprises such as radio and television production and communication, snowshoe and canoe manufacture, air service, wild rice marketing, and timber extraction. Such activities often have heavy social, financial, and organizational responsibilities. While the Natives will have to identify those areas in which they would like to use the resources of the University and the ways to use those resources, experience has demonstrated roles for the University.

7.1.1 Businesses and organizations

The theories, practices, and skills of organizing and administering small businesses, communities, and organizations will have to be acquired by more Natives as they assume more control and responsibilities. The Small Business Assistance Program in the School of Business, the University's Centre for Regional Development, and faculty members in Sociology, Business, Biology, and Forestry have assisted a variety of Native people and organizations. These included Wa-wa-tay Communications in Sioux Lookout, Pays Plat canoe and snowshoe manufacturing, political organization in Aroland and Fort Hope, and Gull Bay timber harvesting.

7.1.2 Community and social services

Community and social services such as education, family and children services, health care, and social planning require professional field workers and administrators. There is a demand for Natives who can provide these services to their own people. Native teachers have been trained in the Native Teacher Education Program and the Native Language Instructors Program of the Faculty of Education and Natives have graduated from the M.Ed. programs of the Faculty of Education. Native students have graduated in Social Work and Nursing and both of these departments have plans to develop programs more specifically addressing the needs of Natives and Native communities.

Nursing and Social Work professors have used Northern Scientific Training Grants from the federal government to send senior students into Northwestern Ontario communities to study and gain experience in Native community social services. Some of these students have been Natives.

Studies by some Social Work professors may establish more culturally relevant principles for providing social services to Natives. A university that strives to serve a Native population will certainly have to consider whether the practices usually advocated in the community and social service professions are appropriate for Native applications. The whole issue of delivering such services in small and remote Native communities may have implications

and applications for other small and remote communities in the north which have traditionally been served in styles developed in and directed from the more populous urban, non-Native areas of southern Canada. In a recent article, Lanken compared the Inuit community of Frobisher Bay, N.W.T. rather unfavourably with the Inuit community of Nuuk, Greenland. A Canadian Inuit was quoted as saying, "The Greenland example is encouraging to us, particularly in the preservation of language and culture. But we (in Canada) expect to do very well, too, once we have our lives under our own control". Lanken said of a Canadian Inuit student teacher that, "He is at home in two worlds, in two languages, and seems unwilling to surrender either" (Lanken, 1986:8–19). If that is true for many Natives of Northwestern Ontario, then there is a place for a university that is knowledgeable about and sensitive to the needs, interests and circumstances of the Natives to assist them in achieving their aspirations.

7.1.3 A cultural resource

While the definition and maintenance of their culture is primarily the responsibility of Native people, these people can be helped by the University recognizing its important role in Northwestern Ontario. The research, library, and information dissemination resources of Lakehead could serve useful and largely unduplicated functions for Northwestern Ontario Natives in particular. A Native College or other educational and cultural centre would assist in conserving and transmitting Native culture.

8 Toward a greater role

8.1 What we have learned

It would be unfortunate if we had not learned from experiences with Native students and regional Native groups. I offer the following suggestions.

1. In Northwestern Ontario northern studies includes Native studies and vice-versa. The regional northern environment — boreal forest, isolation, distance, winter — and the Native people are inseparable.

2. Despite the preceding statement, it is not sufficient to use just the term "northern" when Native studies or activities are also included. Terms such as "Northern and Native Affairs" serve better to designate the University's particular interest in Native affairs and studies.

3. The successful establishment of the Education programs required (a) a need to be met, (b) political acumen and determination by the promoter, (c) start-up and maintenance funding from outside agencies, (d) Native consultation and participation, (e) continued cooperation with Natives and the federal department for Indian affairs (Indian and Northern Affairs Canada), and (f) adaptable faculty. These elements will be important in future endeavours.

4. The Native people bring a knowledge of their circumstances and aspirations. Failing to involve them early and genuinely in planning university initiatives is inconsiderate

and unproductive. On the other hand, some care needs to be taken to ensure that the advice received is relevant, useful, and representative of the opinions of Natives and Native communities.

5. Faculty members will be more effective in their work with Natives if they have an interest in and appreciation of Native history, culture, and circumstances. Some inservice training opportunities should be part of the implementation of programs for Natives. Travel to Native communities and interaction with Natives would be informative.

6. Learning styles of many Native students may differ in some respects from those of the students we are more used to, and from those of most of us. Different perspectives should be recognized and respected. Care in using appropriate teaching methods is in order.

7. The principles that work in the businesses, organizations, and community and social services that we normally are preparing students for may not be the principles that work best in Native ones. Not a lot is known about this; some research in this area could be fruitful. Care and caution in what we teach is required. We can learn from our Native students. A more detailed examination of the principles for delivering human services in northern and Native communities is contained in the paper by Nelson, McPherson, and Kelley elsewhere in these Proceedings [4].

8. Professional programs must include a useful and significant practicum experience for students in Native organizations and communities. This requires disproportionately high costs for students and staff involved and also requires productive interaction and liaison with the Native organizations and communities.

8.2 Faculty adaptation

Successful implementation of Native studies initiatives will require a group of faculty that have or are willing to develop the necessary knowledge and expertise. Natives on the faculty will be necessary. Funding should include costs of inservice training for faculty in such areas as regional Native history, Native traditions and culture, ways of thinking, good communication skills, and effective teaching methods.

Faculty involved in Native studies activities should have opportunities for regular travel to Native communities and organizations. Such travel is expensive and time-consuming. It should also be done in different seasons and for extended periods.

8.3 Proposals for the near future

A strong emphasis on service to Natives and Native communities would be a notable and worthwhile contribution by Lakehead University to the welfare of Northwestern Ontario and to its own efforts to establish a distinguished and characteristic specialization. The present state of interest and activity in Native studies and matters is entirely the result of faculty and departmental initiatives. A serious intent by Lakehead University to make Native studies and serving Native interests an intrinsic part of its operations will require

concrete and sustained actions by the University as an institution. Most of the following recommendations are derived from the Report of the Presidential Advisory Committee on Northern Studies.

8.3.1 An institutional commitment

Native Advisory Committee. Until a committee is established to promote, facilitate, and coordinate University activities for Natives and Native students, there is little possibility of real institutional commitment or progress. At present, Native issues generally are subsumed by northern issues, an arrangement which has limitations and disadvantages.

Native students. The Committee recommended that the Univesity take actions that will attract Native students to its programs, serve their interests and needs, and support them while they participate. The advice from various sources for doing this has been discussed earlier (see sections 6.3.1 and 6.3.2).

Coordinator for Northern and Native Studies. Some centralized support and coordination of faculty activities will provide a continuity and visibility to University Native studies that should enhance the effectiveness of the work and attract interest and funding. The Advisory Committee recommended the appointment of a full-time coordinator for Northern [and Native] Studies who would coordinate and promote instructional and research activities by faculty and educational services for Native students. (NSC p. 7)

Embedded funding. Most of the funding for these proposals should be built into the annual operating budget of the University. Making such actions in Northern and Native studies dependent on external funding will demonstrate a tentativeness and lack of commitment to the concept.

University governance. In order to give Native studies and Native students more prominence in University decision making the Committee recommended actions for the Board of Governors and the Senate. (NSC p. 30)

The Board of Governors should appoint a Native from Northwestern Ontario to the Board. A Committee on Native Affairs might also be a worthwhile Board initiative and expression of commitment to Native interests. A joint committee with Senate might make sense.

Native interests should be effectively represented on Senate, preferably by a Native person. This could be accomplished by establishing a standing committee on Native Affairs.

8.3.2 More ambitious steps

The Committee recommended that the University further establish its interest in and commitment to Natives and Native affairs through such actions as establishing a Centre for Northern [and Native] Studies, a northern health studies program, a graduate degree, a special library division, University sponsored publications, and a Native College.

8.3.3 Proceeding with caution

It would be unwise to underestimate the time, money, and effort that will be required to establish a sound and credible reputation for research and other scholarly work, education, and service to the Natives and Native communities of Northwestern Ontario. These costs suggest some caution but should not deter the University from assuming greater roles and responsibilities with respect to the Native people of Northwestern Ontario. In doing so, it would become a better university for other students and for the entire region.

9. Notes

1. Main source[s] for section 3: (a) Lakehead University, 1984; (b) Rowe, 1972; (c) Royal Commission on the Northern Environment, 1985; (d) Mitchell, [1986].
2. Director, Native Teacher Education Program: Harold Linklater; Co-ordinator, Native Language Instructors program: Mary Mitchell: Address: Faculty of Education, Lakehead University, Thunder Bay, Ontario, Canada, P7B 5E1.
3. In this section of the paper references will be made to the following reports:
   1. Lakehead University, "Lakehead, the University of Northwestern Ontario". A submission to the Commission on the Future Development of the Universities of Ontario [the Bovey Commission], August 1984. This will be referred to as the Bovey Submission or BS.
   2. Corbett, Ruth, and Frewin, C. "A Review of the Native Teacher Education Program (N.T.E.P.) at Lakehead University, Final Report". A report prepared for the Faculty of Education, Lakehead University, February 1985. This will be referred to as the NTEP Review or NTEP.
   3. Lakehead University, "Report of the Presidential Advisory Committee on Northern Studies", March 1985. This will be referred to as the Northern Studies Committee Report or NSC.
   4. Lakehead University, "Northern Studies at Lakehead University", [1986]. This will be referred to as the Northern Studies at L.U. Report or NSLU.
   5. Katt, Mae; Roberts, Liz; Rakoszcy, Mary; and Boone, Margaret. "Workshop: A Dialogue with Native People's Entry into Nursing". A report from a workshop with some interested Native people sponsored by Lakehead University and the School of Nursing, June 1985. This will be referred to as the Entry into Nursing Report or EIN.
   6. Lakehead University Nishinabek Student Association, "Lakehead University Native Student Services for Counselling and Tutoring". A report submitted to the Department of Indian Affairs, April 1986. This will be referred to as the Nishinabek Students Report or LUNSA.
4. Nelson, C.H.; McPherson, D.H.; and Kelley, M.L. "Contextual Patterning: A Key To Human Resource Effectiveness In The North". A paper presented at the Mid-North Universities Conference of the Association of Canadian Universities for Northern Studies, Sudbury, Ontario, June 12–14, 1986.
5. Lakehead University Nishinabek Student Association. "Lakehead University Native Student Services for Counselling and Tutoring". A report submitted to the Department of Indian Affairs, April 1986.
6. Lanken, Dane. "Inuit cousins, but oh how different!". Canadian Geographic, April/May 1986, p. 8–19.

7. Mitchell, M. "A 'Vision' of Algonquian Languages at Lakehead University. A submission to the Dean of Education, Thunder Bay, [May 1986]. (Photocopied).
8. Rowe, J.S. Forest Regions of Canada. Ottawa: Department of the Environment, 1972.
9. Royal Commission on the Northern Environment. North of 50°: An Atlas of Far Northern Ontario. Toronto: University of Toronto, 1985.

10 References

1. Corbett, Ruth, and Frewin, C. "A Review of the Native Teacher Education Program (N.T.E.P.) at Lakehead University, Final Report". A report prepared for the Faculty of Education, Lakehead University, February 1985.
2. Katt, Mae; Roberts, Liz; Rakoszcy, Mary; and Boone, Margaret. "Workshop: A Dialogue with Native People's Entry into Nursing". A report from a workshop with some interested native people sponsored by Lakehead University and the School of Nursing, June 1985.
3. Lakehead University. "Lakehead, the University of Northwestern Ontario". A submission to the Commission on the Future Development of the Universities of Ontario [the Bovey Commission], August 1984.
4. Lakehead University. "Report of the Presidential Advisory Committee on Northern Studies", March 1985.
5. Lakehead University. "Northern Studies at Lakehead University". A report prepared for the Association of Canadian Universities for Northern Studies. [1986].

EDUCATION AT A DISTANCE: THE LAKEHEAD EXPERIENCE

Margaret Boone
Director of the School of Nursing

Dan Pakulak
Director of Continuing Education
Lakehead University

Abstract: A major challenge to all Northern Universities is the provision of continuing education for the residents of its region. The distances between the community and the main campus, the size of each community and the weather conditions present interesting, often difficult, obstacles to those responsible for planning and delivering continuing education programs.

Lakehead University has the largest geographical off campus operation in Canada serving a region which is 523,000 square kilometers in size. The communities included in the off campus operation average 300 kilometers from the main campus.

In order to meet the educational needs of the residents of this area, Lakehead University has chosen Education at a Distance as a model for delivery. In this mode, professors travel to each community on a bimonthly basis to conduct classes.

The classroom lecture mode allows the student to get to know the professor and thus maximize the learning environment established through personal contact. The increase in travel costs as well as the changing educational needs of the students present some difficulties in the use of this delivery mode.

Support services such as library services and administrative mangement are important considerations in providing off campus courses to a widely scattered student population.

Résumé: L'éducation permanente des habitants du Nord canadien constitue une difficile entreprise pour toutes les universités médionordiques. Les grandes distances entre la collectivité intéressée et les services centraux de l'université, la petitesse de chaque agglomération et les conditions climatiques posent des défis intéressants, parfois difficiles à relever pour les responsables de l'élaboration et de la mise en application des programmes d'éducation permanente.

L'Université Lakehead assume cet enseignement dans une region qui est la plus étendue du Canada, car elle couvre 523 000 kilomètres carrés. Les collectivités desservies se trouvent éloignées en moyenne de 300 km de l'Université elle-même.

Pour satisfaire les besoins d'éducation des habitants de cette vaste région, l'Université Lakehead a mis sur pied un programme d'enseignement itinérant. Les professeurs se rendent dans chaque agglomération tous les deux mois pour y enseigner.

La leçon donnée en classe permet à l'étudiant de bien connaître son professeur et, grâce aux contacts personnels, d'optimiser le processus pédagogique. Mais cette méthode d'enseignement cause certains problèmes, à cause du coût des déplacements et de la progression des besoins pédagogiques des étudiants.

Il est important de fournir des services auxiliaires, tels ceux de bibliothèque et de gestion administrative, à une population étudiante très largement dispersée, inscrite aux cours hors-université.

History of the Department

Continuing education has been an integral part of Lakehead University since its inception. In 1965, the University granted its first degree and in 1968 the Continuing Education Department was established. The early programs to the region were primarily in the Arts and Sciences and it was these programs that met an identified need within the Northern communities.

During the early years, programs were planned in response to the large number of teachers in the area requiring baccalaureate preparation. However, by the early '70's, needs had changed and it was evident that the requirements of the teachers had changed to courses which were necessary to update professional qualifications. There were very few Ministry of Education courses offered in Northwestern Ontario. This meant that teachers were required to travel great distances to obtain the necessary qualifications. With the support of the local Boards of Education and the teaching population, a division of Continuing Teacher Education was established in the Faculty of Education in 1974. The student enrolment in Education now comprises 1/3 of the total student enrolment in continuing education. Increasing educational demands prompted Lakehead to investigate alternative methods of course delivery.

In the late 1960's and early 1970's, Lakehead University experimented with distance education using video transmission and audio-teleconferencing. Lakehead was a forerunner in the field of distance education; however, because of fiscal cut backs and because of poor course planning and development, Lakehead's first experience in distance education was abandoned by the mid-1970's. However, in the past year, there has been a renewal of interest in distance education as recent literature clearly indicates the need for both teacher and student to be prepared for the use of technology (Bates, 1982; Rogers, 1982; Burge, Roberts, Waldron, 1984). Tempered by the experience of the past while keeping an eye on developments at other universities, Lakehead, it appears, will once again undertake the challenging field of distance education with renewed rigour. The Continuing Education Department will continue to develop alternate modes of course delivery and yet remain sensitive to the learning needs of individuals throughout the region of Northwestern Ontario.

At present, Lakehead University offers courses in Arts with most majors, Bachelor of Education, Master of Education, Library Technology, Nursing and Business Administration. These courses are offered in 16 - 18 communities scattered from Kenora to Sault Ste. Marie and stretching as far north as Red Lake and Ear Falls. The University has also responded to requests as far north as Moosonee and as far east as Pembroke.

While the University offers a wide variety of courses, the most popular to date are Bachelor of Arts (General Program) and Bachelor of Education (Extension) (see table 1 of course offerings and enrolment).

Students in these programs are dedicated and highly motivated. In 1984, it was an out-of-town student who received the Chancellor Medal for highest standing by a part-time student. The average age of the students is in the mid-30's and 95% are female.

Mode of delivery

The term "education at a distance" perhaps best describes the mode of delivery at Lakehead University. While courses are offered at a great distance from the campus, this is accomplished with the presence of the professor in the community. During the Fall and Winter terms, professors travel to the communities on a bi-monthly basis, conducting classes for 3 hour periods on Friday night and Saturday morning. During the Spring and Summer term, the professors reside in the communities for a six-week period. Travel to the communities may take a variety of forms such as car, train, plane and sometimes skidoo.

Table 1

YEAR/FACULTY	NO. OF CENTRES	NO. OF F.C.E. COURSES	WEIGHTED ENROLLMENT
1985-86	13		
ARTS		20.0	224.0
SCIENCE		—	—
EDUCATION		8.0	159.0
UNIVERSITY SCHOOLS		2.5	24.0
TOTAL 1985-86	13	30.5	407.0
1984-85	13		
ARTS		15.0	217.0
SCIENCE		—	—
EDUCATION		7.5	93.5
UNIVERSITY SCHOOLS		1.0	10.0
TOTAL 1984-85	13	23.5	320.5

There are many advantages and disadvantages to this mode of delivering courses. One reason for maintaining a lecture format with the professor present is simply student preference. The classroom lecture mode allows students the opportunity to get to know the instructor and thus maximize the learning environment established through personal contact. It also provides an opportunity for discussion, debate and exchange of ideas. In many of our isolated communities the classes themselves may be viewed as a social event bringing people together and providing an intellectual climate for the community. Howard and Baker (1984) point out that participation in extension programs can benefit those involved by developing a "feeling of fellowship and community" (p. 67). Strother and Klus point out that preference for the lecture format with the instructor present may occur because most students are accustomed to that method.

Similar benefits may result from alternative delivery modes. Roger's 1981 study of the nursing students in Kenora, Ontario, indicated a preference for mixed media delivery systems which maintained some aspect of personal contact with the instructor.

The ability to provide for instructors to be present for each course is a difficult task. While this may be a desired mode of delivery, it has certain disadvantages.

The increasing cost of travel and of salaries means that this form of extension education is increasingly impractical. The distances travelled are exhausting for instructors who must then teach two three-hour lectures. The time necessary for travel is also expensive for professors who are also engaged in research and in writing.

In many of our small isolated communities, it is difficult to plan for courses which meet the needs of the community members. A minimum of eight students is required in order to mount any of the courses offered. The average number for each course is 12 with some courses such as those in Education, having an enrolment of 50.

A minimum class size of 8 may not present a problem in some areas; however, in communities with a population of 5,000 or less, this is often a barrier. It is often difficult to find the right people who have the necessary academic qualifications, the desire for or need of the same course in a given year and who are available at the same time. It is therefore impossible to address the need of some specific groups.

Identifying the need for courses may be done either by surveys such as the one conducted by the School of Nursing in 1979 or by community demands. Whether the needs are identified through surveys or community response, the importance of planning must be considered. Planning is perhaps enhanced in the case of specific professional programs such as Nursing, Library Technology, and Education, where the majority of courses are mandatory and do not depend on consensus for selection.

Figure 1

Support services

Strother and Klus emphasize the importance of support services if students of continuing education are to be successful. (pp. 235-253).

Support services are made available to students in the courses from Lakehead University. Books, printed material, and audio/visual equipment are sent to the communities and remain there for the duration of the course. In addition, students have full library privileges. The holdings at the main University library are available on microfiche at the local libraries in the region. Students may call, toll free, and have books or photocopies of articles sent to them within 24 hours. This service is available at no charge.

Administration

The Continuing Education division is managed on campus by 2 people, the Assistant Registrar (Continuing Education) and a secretary. The Assistant Registrar is responsible for determining courses, scheduling classes, registration and collection of payments, travel arrangements for instructors, and the overseeing and administration of the off campus operation. In addition, each community has a local representative who reports to the Assistant Registrar (Continuing Education). The community representatives are responsible for the arrangement of classroom facilities, living accommodations for professors and serving as a general liaison between the community and the Continuing Education Department of Lakehead University. In addition, the planning, policy setting, and review of programs is the responsibility of the Senate Committee on Continuing Education. The makeup of the committee provides for representation from faculty, administration, students and off campus community representatives.

Summary

Lakehead University has had a long history of providing educational programs to the people of Northwestern Ontario.

Changes are occurring which will bring about the integration of the personal contact with professors, as well as the technology needed to assist us to reach even more people.

The people of the region have been very supportive of our programme and are anxious to engage in new ventures. Lakehead University has recently initiated courses integrating a teleconferencing component. The University will continue to search for new and innovative ways of meeting the educational needs of the region while at the same time recognizing the importance of student preference in selecting appropriate methods of course delivery.

References

Bates, A.W. (1982). Learning from audio-visual media. Institutional Research Review, 1, 33–57.

Burge, E., Roberts, J. and Waldron, M. (1984). Audio-conferencing in continuing education: A case study with implications. Canadian Journal of University Continuing Education, 10(2), 20–32.

Fish, T. (1979). Summary of Survey data: Continuing Education Needs of Registered Nurses in Northwestern Ontario. Lakehead University. Unpublished.

Howard, T. and Baker, H. (1984). Constructive public involvement. Ind. Blackburn (ed.). Extension Handbook. Guelph: University of Guelph.

Lakehead University (1984, August). Submission to the commission on the future development of the universities in Ontario. Lakehead University, Thunder Bay, Ontario.

Rogers, K. (1982). Identifying an effective and efficient distance education system. Canadian Journal of University Continuing Education. 8(2), 37–42.

Rogers, K. (1981). Identification of a learning effective and cost efficient distance education delivery system. Unpublished master's thesis. The University of Guelph. Guelph, Ontario.

Strother, G. and Klus, J. (1982). Administration of Continuing Education. Belmont, California:Wadsworth, Inc.

IN SEARCH OF A NICHE FOR SMALL, ISOLATED FACULTIES: THE COMPLEMENTARITY OF TEACHING, RESEARCH, AND REGIONAL SERVICE

Roderick W. McLeod, J. David Bates and Laurens L. Korteweg
Lakehead University

Abstract: The challenge of balancing institutional expectations related to teaching, scholarship/research, and service when a faculty is small and its university is located in a region that is relatively remote from the major academic centres of the country is examined in this paper. The Faculty of Education at Lakehead University faces such a challenge. The complementarity between and among these traditional university expectations is illustrated through selected examples of recent work by faculty members. Implications of such an approach for faculty, universities, and governmental agencies include awareness raising of increased opportunities for such integration, developing appropriate supportive reward systems, fostering facilitative inter-university networks, informing governmental agencies of the needs and opportunities for educational research in the provincial north, and encouraging truly symbiotic relationship between faculties and the field.

Résumé: Les auteurs examinent les difficultés de maintenir l'équilibre entre les attentes universitaires en matière d'enseignement, d'études et de recherches, et de service à la collectivité que peut assumer un corps enseignant peu nombreux, dans une université éloignée des grands établissements de haut savoir. La Faculté de pédagogie de l'Université Lakehead doit relever un tel défi. Les auteurs illustrent l'interdépendance entre ces différentes activités traditionnelles des universités par des exemples choisis de travaux professoraux. Pour les enseignants, les universités et les organismes publics, une telle

approche entraîne: une prise de conscience des possibilités nombreuses offertes par l'articulation de ces activités et de la nécessité de mettre en oeuvre un mécanisme rétributif convenable, de créer des réseaux interuniversitaires auxiliaires, d'informer les organismes publics des besoins de l'effort de recherche pédagogique dans le Nord de la province concernée et des possibilités ainsi offertes, et d'encourager une étroite coopération entre les professeurs et les enseignants sur le terrain.

The challenge for a small faculty

Lakehead University is located in Thunder Bay, Ontario, about 1 500 km from the provincial capital, Toronto. The Faculty of Education at Lakehead University is the only education faculty away from the population centres of southern Ontario with teacher education programs which include graduate level studies. It has twenty full-time faculty members and an annual enrolment in the undergraduate program of about 350 students. There are about 100 graduate students enrolled of which 10 are full time. The others are registered in part-time studies offered on campus and in four regional centres. As well, the faculty offers continuing professional studies for certificated teachers during the summer and regular academic sessions.

Educational research in the province of Ontario has been dominated by three or four of the larger, well-established southern Ontario Universities, and funded largely through governmental agencies. The remoteness of Lakehead University from Toronto, the political preference for funding "provincial" educational research, and the tradition of looking to the older, larger faculties with well-developed research infrastructures contribute to the research challenge facing Lakehead's Faculty of Education. In addition, the Faculty's service to the field is compared and contrasted with the services offered by the regional office of a southern Ontario institution which provides not only faculty whose full-time assignment is service to the field but also access to the parent institutions resources (e.g. other faculty, information bases, southern contacts, financial support). In both the research and field service areas the competition is keen. As well, expectations in these areas are often viewed as being in competition with heavy teaching responsibilities.

At Lakehead University the collective agreement between the Board of Governors and the Faculty Association identified three major components of a faculty member's responsibilities: teaching, research and scholarship, and service to the profession and community. Articles dealing with rights and responsibilities, tenure, and promotion spell these out in some detail.

How does a professional faculty in a small university in a relatively remote region cope with the expectation of research and scholarship when its historic tradition has been one of teaching and service?

Answering the question is complicated by the factors discussed earlier. Added to these is the reduction of human resources and financial support evident especially during the past decade. In looking for a niche for research and scholarly work, the characteristics of the region are relevant. One-half of the fewer than 250 000 people of Northwestern Ontario are in and around Thunder Bay while most of the rest are scattered in small, isolated communities with resource-based economies. About twenty percent of the population is

Native. The region which Lakehead University tries to serve is about the size of France. Travel between Thunder Bay and the communities in the region can be done by air but it is time-consuming and expensive.

While teaching, scholarship and service may be viewed as discrete and in competition for a faculty member's time, energy, and effort, the task so created becomes unmanageable. As an alternative, this paper examines the complementarity of the teaching, research and scholarship, and service responsibilities and proposes planned integration as one way to answer the question posed above. The following sections provide an historical backdrop, selected illustrative examples of the integration of scholarship with teaching and service, and some concluding observations on the implications for the university and the faculty.

Historical background

Teacher education in and for Northwestern Ontario commenced with the Lakehead Teachers' College in 1960. Nine years later in 1969 the College was amalgamated with the fledgling Lakehead University through an Order-in-Council and the current Faculty of Education was created. Initially, the Faculty offered only pre-service teacher education spanning the elementary and secondary panels. Responding to the needs of regional educators for professional renewal, the Faculty added a Bachelor of Education (Extension) program in 1972 and graduate studies leading to a Master of Education in Curriculum and Educational Administration were added in 1974. A two-year diploma in Native Teacher Education designed specifically for people of Native ancestry commenced in 1975. In 1979 the Faculty made major modifications to its continuing teacher education offerings to accommodate the Additional Qualification courses previously offered by the Ministry of Education for certificated teachers. A Native Language Instructors' Diploma was added in 1981 with specialization in either first or second language development. In 1985 this program was extended to meet the requirements for the Ministry's Native Language Teachers' Certification program. Each initiative has brought with it expanded teaching responsibilities for the eighteen full-time professors and the two Teacher-Counsellors in Native Teacher Education.

While teaching responsibilities have expanded significantly over the past fifteen years, the past five years have brought a heightened emphasis on scholarship and research. Two events which contributed to this were the unionization of the university faculty and the province wide review of graduate studies in education by the Ontario Council of Graduate Studies. The former resulted in a single set of institutional criteria for promotion, tenure, and renewal. The latter called for a greater provincial emphasis on research in graduate studies in education. This new reality has underscored the need for our faculty members to reconsider the balance among teaching, research and scholarship, and service and where possible to seek opportunities to integrate the three.

In the following section we briefly describe a current research contract with the Ministry of Education in which we are examining the program delivery modes utilized in small secondary schools in Northern Ontario. All three researchers teach in courses preparing students for secondary school teaching certification. Two are involved in graduate studies of curriculum and program administration. By focusing our study on secondary schools

in the north this research is relevant to our teaching. As well, by providing summaries of each phase of our study and workshops for participating schools, we are integrating our research with service to the region.

The small schools study

Background

Many of the communities in the more populated parts of northern Ontario have populations in the 1 000 to 4 500 range and support a small high school. This part of Ontario extends from the French River south of Sudbury and North Bay north to Highway 11 in northeastern Ontario and the mainline of the Canadian National Railway in northwestern Ontario. There is one secondary school north of Highway 11 in Moosonee that offers full programming. There are English, French, and combined English/French schools. Most of the communities depend predominantly on mining, agriculture, or transportation for their economic base. In addition to being small, the communities are often relatively remote.

Secondary school populations in Ontario as elsewhere have generally been declining during the past decade. School populations in northern Ontario have been reduced partly from overall declines in secondary school-age children and partly from local economic conditions. A few of these mainly one-industry resource-based communities have been in a boom part of their typical boom and bust cycles and have had increasing school populations. All the schools have found challenges in providing good secondary school programs to small numbers of students at a cost that is acceptable.

Declining enrolment and its effects on schools were the subject of much study and speculation in the 1970's, of which the Commission on Declining School Enrolments in Ontario (CODE) was a major one. The CODE report (Jackson, 1978) was published before declining enrolments had really begun to affect secondary schools. Most of the studies had more to do with financing, adjusting school staff, general administration, and such politically difficult steps as closing schools. Very few of the studies considered the problems of delivering school programs.

In addition to declining numbers of secondary school-aged children, other factors such as the establishment of French-language schools and changing government regulations have affected public secondary school populations in these communities and the ability of the secondary schools to deliver their programs. In the early 1980's the Ontario Ministry of Education established a Commission to study the problems of small secondary schools in northern Ontario. It made a number of recommendations, some of which addressed program delivery (Allan, 1983).

All the school boards were coping in one way or another with small, usually declining, populations. One northwestern Ontario school board in particular made a major effort through an "Alternate Delivery System" to meet the problem with innovative methods and new technology (Bates, 1982).

There has been no major systematic study in Ontario to assess the effects of declining enrolments in secondary schools after decline had occurred, and in particular, no systematic study of program delivery. This appeared to be generally true across Canada.

Purpose of the study

In 1985 the Ontario Ministry of Education expressed an interest in studying the strategies these small secondary schools in northern Ontario had used in coping with declining enrolment, how well they had worked, and what could be learned that would be instructive for schools coping with small or declining enrolments. It entered into a contract with Lakehead University for such a study.

Conceptual framework

The conceptual framework for the study was based on work by Bussard and Green (1981) in their study of six school systems in the United States that had only one high school. They classified program delivery strategies in three categories: (a) strategies using resources within the school system, (b) strategies involving cooperation between school systems, and (c) strategies using educational and community institutions outside the school system.

A study of program delivery in small high schools in Saskatchewan (Ryan, Sackney, and Birney, 1981) provided additional perspectives on studying program delivery in small Canadian secondary schools and on visiting other jurisdictions, while a study in Newfoundland and Labrador (Meaney, 1976) provided a framework for taking a stud beyond administrators to teachers and students.

Schools involved

Twenty-two small, more or less rural or remote, secondary schools were selected for the study. All the schools were in small communities with populations in the 1 000–4 500 range. Most of the communities had single-industry resource-based economies. A few served predominantly rural areas and a few served mixed economy areas. All schools have students bused in from surrounding areas, sometimes as much as 110 km. The resource-based communities usually served people strung out along one or two main roads or living in a few smaller communities. The few rural areas had a more evenly distributed population. We refer to many of the schools as remote; by remote we mean schools that are more than a one hour drive from another secondary school of the same language of instruction. Three schools were in urban-based boards of education but were in communities some distance from the urban area. Five of the schools gave instruction in English and French. This study was restricted to programs where English was the language of instruction.

This set of schools included schools that were remote and the only secondary school in the board, schools that were remote and one of several secondary schools in one board, schools that were rural and remote, schools that were rural and not remote, and a two-campus school.

Methodology

The study has been carried out in three main phases:

1. First, a survey of the literature and visits to education officials in Alberta, Manitoba, and Saskatchewan with interests and responsibilities in small school programs and distance education;

2. Second, a questionnaire survey of the principal, teachers, and students of twenty-two small, remote secondary schools identified in northern Ontario, and

3. Finally, interviews with a selected sample of principals, teachers, and students from some of the schools surveyed and with other officials with related interests and responsibilities.

The study was patterned after a model used in the U.S. Department of Health, Education, and Welfare and described by Hendricks (1981). This method utilized purposive sampling rather than some form of random sampling to obtain relatively quick and efficient answers to questions of program evaluation and policy making.

The method included:

1. A preassessment of local realities and important issues. In this study, we used our knowledge of the northern Ontario schools built up through many visits and interactions with the schools, boards of education, and officials by the three of us over more than fifteen years, discussions with Ministry of Education officials, various inquiries, and the like to make this preassessment and select the schools that would be asked to participate. Then, with the support of the Ministry, we sent out questionnaires to gain additional information for planning the interview phase.

2. One-to-one personal discussions with a wide variety of local respondents.

   School principals, some teachers and students, directors of education, and others involved in delivering and receiving school programs will be interviewed.

3. Retrieval of local data.

   This was done as much as seemed necessary to supplement information obtained from the questionnaires and Ministry of Education records.

On-site visits were selected by criteria derived from the purpose of the evaluation. On-site interviews sought a more comprehensive perspective and provided flexibility to pursue relevant information.

Publication of work and funding

This study is in progress, and publication of the results must wait until the final report has been submitted to the Ontario Ministry of Education which is scheduled for June 1987. Individuals wishing further information may contact Dr. R.W. McLeod, Dean, Faculty of Education, Lakehead University, Thunder Bay, Ontario, Canada, P7B 5E1. The financial support of the Ontario Ministry of Education for this study is duly recognized.

Other examples

Native literature

Other faculty members have successfully integrated their teaching and scholarship. The following examples demonstrate this. In our Native Teacher Education program, students

are required to take a course in North American Indian literary Studies. In 1974 there were not many anthologies of Native literature readily available for use. The faculty member responsible for teaching this course undertook the task of seeking out suitable Native literature from published and archival sources. This research culminated in the publication of an anthology of Native literature, *First People, First Voices* (Petrone, 1983). The book is a valuable resource for our students in this course, and it has received national and international acclaim for its contribution to Native literary studies.

Native language teaching materials

The development of classroom instructional materials related to the teaching of the Algonquian languages is an integral component of our Native language Instructors' Program. This is another area in which there are limited printed resources available for classroom use. As part of a Materials Development contract with the Ministry of Education, a text for second language studies in Ojibwe is being developed for use with secondary level students. This material will be forthcoming (Mitchell, in press). Again, the integration of teaching, scholarship, and service is demonstrated.

Mathematics

The development of teaching methods, instructional materials, and service to the profession have resulted from a research project which has examined the effects of multiple vs. single embodiment of number concepts in the primary grades (Vervoort, 1986). This research has provided a very valuable springboard for service to the profession through a number of workshops with participating classroom teachers and has provided many meaningful examples for use in methods classes with preservice teachers.

Language arts teaching

Another colleague has integrated part of her research agenda with the courses she teaches (Courtland, 1986; 1985). In her Language Arts classes with preservice teachers she has been examining the use of writing folders and related writing-as-process activities to heighten the awareness of and sensitivity to the writing process. She has also built action research assignments into her courses in primary education. These will provide the basis for a meta-analysis of such strategies for curriculum changes with practising classroom teachers.

Field placement

An integral and important component of a preservice teacher's professional preparation has been the field placement or student teaching assignments. This aspect of teacher education has received increased attention both in Canada and abroad over the past few years. A number of our faculty members have become involved in the systematic study of this component of teacher education (Courtland, Korteweg, Linklater, Power, 1985; Korteweg, 1986). Such work not only informs our practise but also is helping to shape a much needed theoretical framework for this part of an individual's professional education.

An integrated approach

In the preceding sections of this paper we have presented selected research and scholarly activities our faculty have undertaken over the past decade. In part, these have been in response to the emerging realities in which we find ourselves as a small Faculty of Education in an isolated region. In an attempt to resolve the conflicting demands on a faculty member's time we have discussed an approach to research and scholarship which emphasizes integration with teaching and service to the profession and region while recognizing the distinctiveness of each. Figure 1 diagramatically represents such integration.

TEACHING-SCHOLARSHIP-SERVICE:
AN INTEGRATED PERSPECTIVE

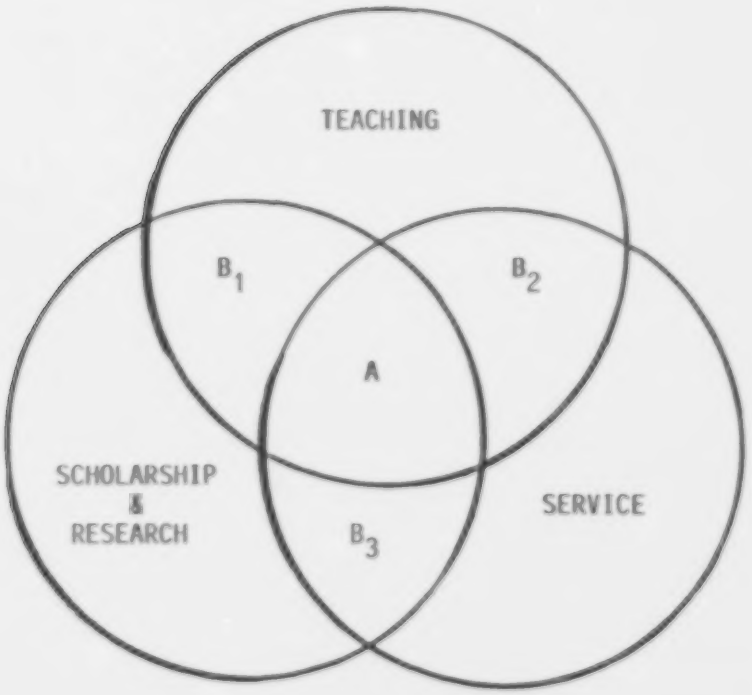


Figure 1

We have described opportunities to integrate research and scholarship with teaching (B_1). Integrating teaching and service to the profession and region (B_2) appears to be an area in which scholarly analysis and meta-analysis could be informative to those concerned. The integration of scholarship and service to the profession and region (B_3) has also been shown to be an area with opportunities for research and scholarship. In the description of our current research contract with the Ministry of Education to examine the program delivery strategies used in small secondary schools in Northern Ontario, we have discussed the integration of all three functions (A). Such an integrative approach appears not only to provide a much needed focus for a university with a region to serve but also to ensure a realistic balance between and among teaching, research and scholarship, and service.

Implications

An integrated approach to research and scholarship as discussed in this paper has potential to focus the research and scholarship of a professional faculty but to be successful it requires modifications to a number of traditional mindsets. These changes must involve not only faculty members but also institutional administrators and governmental agencies.

Awareness raising among faculty members of opportunities for integrating scholarship with teaching and service must be undertaken. The institutional reward system must recognize such efforts. Alternative methods of documenting scholarly excellence for institutional reward systems must be actively sought and implemented.

Networking between institutions across the provincial norths designed to complement each other's strengths will also require modification not only of institutional mindsets but also those of governmental agencies. This will take time and effort.

Governmental agencies will have to be lobbied to change some of their traditional granting and contracting practices where these have worked to the disadvantage of small and remote faculties. We also need to inform them on what is needed in the provincial northern regions and to cooperate with the practitioners in the field to promote mutual interests.

As we move in this direction, we need to keep in mind Goodlad's (1986) recent caution to ensure that the relationships we build between professional faculties and the field practitioners need to be truly symbiotic in nature. The needs of each must be clearly recognized at the outset and any project must be designed to ensure each is met. The integration of research and scholarship with teaching and service to the profession and region provides areas rich with opportunities for cultivating such relationships.

References

Allan, G.R. (1983). The Report of the Commission of Inquiry Regarding Small Secondary Schools in Northern Ontario. Toronto: Ontario Ministry of Education.

Bates, D. (1982). The Lake Superior Board of Education A.D.S. Project (A report to the Board of Education). Thunder Bay: Lakehead University.

Bussard, E., and Green, A.C. (1981). "Planning for Declining Enrolment in Single High School Districts." In K. Klein (Ed.). Managing Declining Enrolment. Bloomington, Ind.: Phi Delta Kappa.

Courtland, M.C., and McLeod, R.W. (1985, May). Implementing Writing-as-Process Strategies with Pre-Service Student Teachers. A Paper presented at the Canadian Society for the Study of Education, Montreal, Quebec.

Courtland, M.C., Korteweg, L.L., Linklater, H., Power, D. (1985, May). Toward Responsive Evaluation of the Student Teaching Practicum: Current Practices, Issues, and Strategies. A symposium presented to the Canadian Society for the Study of Education, Montreal, Quebec.

Courtland, M.C. (1986, May). Writing-as-Process Strategies in Preservice Education. A paper presented to the Fourth International Conference of the International Federation for the Teaching of English, Ottawa, Ontario.

Goodlad, J.I. (1986, April). Essential Connections for Preparing Better Teachers. A paper presented to the American Educational Research Association, San Francisco, California.

Hendricks, M. (1981). Service Delivery Assessment: Qualitative Evaluation at the Cabinet Level. In N.L. Smith (Ed.), New Directions for Program Evaluation: Federal Efforts to Develop New Evaluation Methods. San Francisco: Jossey-Bass Inc.

Jackson, R.W.B. (1978). Implications of Declining Enrolments for the Schools of Ontario: A Statement of Effects and Solutions. Toronto: Ontario Ministry of Education.

Korteweg, L.L. (1986). Mentoring Under Stress: The Case of Teacher Education. In W.A. Gray and M.M. Gray (Eds.) Mentoring: Aid to Excellence (Proceedings of the First International Conference on Mentoring — Vol. I). Vancouver, B.C.: International Association for Mentoring.

McLeod, R.W., Bates, J.D.; and Korteweg, L.L. (1986, June). Program Delivery in Small Secondary Schools. A paper presented to the Canadian Society for the Study of Education, Winnipeg, Man.

Meaney, L.J. (1976). A Study of Small Central High Schools in Newfoundland and Labrador. Unpublished Master of Education Thesis, Memorial University, St. John's, Newfoundland.

Mitchell, M.L. (in press). Introductory Ojibwe. Toronto: Ontario Ministry of Education.

Petrone, S.P. (Ed.) (1983). First People, First Voices. Toronto: University of Toronto Press.

Ryan, A; Sackney, L., and Birney, H. (1981). Program Delivery in the Small High Schools. (Saskatchewan School Trustees Association Research Centre Report No. 76). Regina: Saskatchewan School Trustees Association.

Vermont, G. (1986, June). Multiple vs. Single Embodiment in the Primary Grades. A paper presented to the Canadian Society for the Study of Education. Winnipeg, Manitoba.

CONTEXTUAL PATTERNING: A KEY TO HUMAN SERVICE EFFECTIVENESS IN THE NORTH

C.H. Nelson, D.H. McPherson and M.L. Kelley
Lakehead University

Abstract: The authors propose that the principle of contextual patterning can serve as the key to improving the effectiveness of human service delivery to northern resource dependent communities and Indian communities. The paper presents many examples of how utilizing the principle of contextual patterning provides the means for understanding how these northern communities function quite distinctly from their urban counterparts. The paper examines the characteristics of urban-focused human service organizations and professionalization that impede operationalizing the principle of contextual patterning when delivering human services in these northern communities. The authors conclude with suggestions of how northern universities can promote the principle of contextual patterning when educating future professional human service workers.

Résumé: Les auteurs indiquent que l'adaptation des services personnels aux modèles socio-culturels permettrait d'accroître l'efficacité de leur prestation dans les agglomérations nordiques tributaires des ressources naturelles, et dans les collectivités indiennes. Ils présentent de nombreux exemples d'utilisation de ce principe, montrant clairement que ces collectivités nordiques se comportent très différemment des collectivités citadines. Les auteurs décrivent ensuite les caractéristiques des organismes de services personnels fonctionnant en cadre urbain et leur professionnalisation, lesquelles empêchent adaptation aux modèles socio-culturels dans les collectivités nordiques. Ils terminent en proposant des mécanismes d'intégration de ce principe à la formation universitaire des futurs travailleurs spécialisés en services individuels.

Contextual patterns in northern communities

Our research began by first learning the intricacies of how members of resource dependent and Indian communities meet human service needs outside of the formal human service structure. As we attempted to understand what we experienced, we found that traditional theoretical models for structuring human service delivery and accepted practices of professional conduct have limited applicability in either of these community settings. We began to notice that differences ingrained in interpersonal relationships within these communities represented fundamental principles of human interaction not found in current academic theoretical models.

We would thus like to begin this paper by describing some aspects of the contextual patterns in northern resource dependent and Indian communities that generally are not recognized, respected, or legitimized by outside and/or professional deliverers of human service programs to these communities. Crucial aspects include complex relationship networks involving mutuality, subjectivity, and strong bonding. These community characteristics

must be seen more on a continuum from urban-to-rural and rural-to-Indian, rather than as mutually exclusive characteristics unique to any single type of community setting. As Chambers puts it,

> rural peoples' knowledge exists in innumerable forms among innumerable groups of people in innumerable environments.[1]

One of the immediately striking characteristics of both resource dependent and Indian communities is the high number and complexity of the interrelationships. This characteristic tends to be most visible in the Indian communities because there is less formal hierarchical structure to mask and interfere. The following discussion demonstrates the crucial elements of relationship networking in a traditional Indian community.

Firstly, members of the Indian community play multiple roles in relation to one another — friend, neighbor, relative, community service volunteer, as well as job-related service giver-receiver roles. Secondly, these roles are reciprocal each being played by all in relation to all others in the community. People are interdependent. Figure 1 illustrates this networking in Indian communities.[2]

Mutuality is the cornerstone for how people relate to each other in both resource dependent and Indian communities. Mutuality is practiced in this way.

> Today I help you; tomorrow you may help me. Because I can help today does not give me any permanent right to feel superior or better. We all have things to contribute to the community. All are essential. For example, a car does not go far without bolts to hold the wheels.

As characteristics, interdependency and mutuality become evident in northern resource dependent communities when one has achieved a degree of *"insideness"*[3]. A major difference of these northern communities is the covertness with which people will describe how a human service is really delivered. People are reluctant to tell an outsider how things really occur. Community members, including the formal helpers, fear they will be *"squealed"* on and lose the autonomy to do what they know has to be done in order to be effective. The following example of the integration of formal and informal activity comes from the emergency and surgical nurse in a resource dependent community of 3,100 residents. She vividly portrays how health improvements for a given patient can be undermined unless the staff extends itself beyond the formal structure. In her words,

> Within the confines of our community hospital, there exists an informal helping network, the purpose of which is to help assist in the provision of services that are not formally provided by the hospital. It functions independently of the formalized hospital policies and procedures. Staff from all areas of the hospital are involved in this informal helping network. . . . A high degree of involvement in the personal lives of the staff is also common with many of the patients. Meals are shared, both staff and patient are involved in mutual social functions; even visits to the summer cottages of staff are made with the patients. At these times not only do the patients benefit from this increased involvement, but so do the family members of the staff as they learn to appreciate and value good health and develop a respect for the disabled and the aged. Furthermore, the staff benefits

Figure 1. Indian Community Network

> daily as this informal helping network helps to relieve the tension of working in a high stress environment; especially when the patient reciprocates with a smile, a phone call or a letter several weeks later. The cards, flowers, or baking that are sent as a token of thanks help to promote a sense of personal worth as well as boost morale and esteem. Both staff member and patient require to share in these basic needs and exchange mutual help. For example, a special lady, our first "unofficial", reluctant long term care patient, was given a colourful quilt as a birthday gift by all the staff. This gift not only acknowledged our sense of commitment to her, but also demonstrated our willingness to have her make her home with us. To reciprocate, she purchased a coloured television set with all the money she had — to donate to the hospital upon her death. Her room became the haven for the illicit cigarette, a place to view an exciting soap opera conclusion, an emergency baby sitting service, and the site for the presentation of many a pair of warm handmade mittens. She assumed the unofficial role of ambassador to her nearby home community and hostess of the unit. A vital communication link was maintained through her and all the patients. This helped to promote a spirit of mutuality. A "kitty" was kept for financial emergencies which could supply a bus ticket home or buy a smokers robot for the man who lost all his fingers to gangrene. . . . I am recognizing how important it is for me to endeavour to initiate, participate with, and complement the work of the informal social support networks within our unique community.

Another characteristic of resource dependent and Indian communities that contrasts with more formal urban environments is the behavior of the person who is an effective helper. The helper is subjective, not objective. The immediate situation rather than standardized and established professional practices becomes the best judge of what must be done. Interaction is natural, casual, and informal. Viewed as laissez-faire by formal systems approaches, attention is focused on the person and not necessarily on the problem. Often the problem will never be directly mentioned. Support given is flexible, without condition, the effective helper providing whatever resources are needed, whenever they are needed. The helper remains accessible and available twenty-four hours a day, seven days a week.

Figure 2 summarizes some of the authors' findings in relation to how help is provided in an Indian community as opposed to the traditional formal non-Indian approach.[4]

In the words of one lady who is a custodian for the life skills program for the mentally retarded in one small resource dependent community.

> The first place people turn when they have a problem, is to someone they know well, and trust — a member of their immediate or extended family or friends. The last place anyone in a small community would turn to is a professional service. It is hard to keep a problem confidential in a small town. Everyone seems to know everyone else's business. Therefore, it is natural for people to form their own basic network of informal support. This system bonds people in time of crisis, as we can depend on our families and friends for more support. It is easier to discuss our personal problems openly with someone we are close to, as opposed to the outsider. We are able to exchange ideas, offer reciprocative services such as babysitting, car pooling, emotional support. . . . We depend on each other

to be there for us . . . . The social agency must try to complement the informal helping network, not ignore or compete with it. If the informal and formal helping networks are able to blend together, the day-to-day practice of human services will greatly improve the quality of the community.

FIGURE 2: COMPARATIVE CHART OF SIGNIFICANT KNOWLEDGE AND VALUES WHICH INFORM PRACTICE PRINCIPLES

INDIAN	WHITE
1. Subjective	Objective
2. Inside client's time & space	Outside client's time & space
3. Time (flexible & qualitative)	Time (compartmentalized & quantitative)
4. Steward	Taker
5. Being	Becoming
6. Person-oriented	Problem/task-oriented
7. Indefinite intervention	Short term intervention
8. Acceptance of change	Control change
9. Goal-access to needed resources	Goal-solve the problem
10. Catalyst (use of self)	Linker (use of environment)
11. Feels no accountability for client problem resolution	Feels accountable for client success
12. Client responsible for assessment	Worker responsible for assessment
13. Allow dependency as #1 resource is worker	Discourages dependency as other resources are #1
14. Maturity — dependence	Maturity — independence
15. Other resources augment use of self as #1 resource	Other resources are #1 value
16. Can't change people	People can be changed
17. Respect	Expertise

Another characteristic evident in northern resource dependent and Indian communities is the diffusion of roles. Who fixes the chair is the person who can best fix the chair at the moment. The determining factor is not based on one having the right credentials but on who has the best life experience at any given moment to complete the task at hand.

In a northern resource dependent community of 3,100 residents lives a man who for over thirty years has mended broken owl wings, has nested baby squirrels suffering loss of their home when a tree was logged in the bush, and has pulled porcupine quills out of the mouths of many a too eager dog. Hospital staff supported his efforts by bringing him out-dated medications. An animal clinic in an urban centre 280 kilometres away was impressed with Ted's work and offered to send him drugs at cost.

> But almost overnight, in the spring of 1978, Ted Tarkka's service began grinding to a halt. The animal clinic that had supplied him drugs changed hands. The new director was startled by a letter from Ted asking for a fresh supply of general anesthetic. He brought the matter to the attention of the Ontario Veterinary Association (OVA), saying that, technically, Ted was practicing without a licence and reminding them of the danger of giving restricted drugs to a layman.[5]

The townspeople were angry. They converged on the local newspaper and wrote to their MLA. The problem was finally resolved when in an unprecedented decision, the OVA agreed that if Ted kept a careful record, always open for inspection, he would be allowed to order drugs through a specially appointed veterinarian. Now Ted must receive direction from others in order to do what he had learned to do. He has set fractures, extracted bones from throats, cut snare wires out of wings of owls and other birds — he was at those moments the only person who could best complete the task. This system was in balance and worked very effectively for many years. The community knew that when an animal was in trouble, Ted was the man to see.

It has been learned that both northern resource dependent communities and Indian communities do demonstrate basic systems approaches that enhance not only the qualities of the individual, but the qualities of the community. The well-functioning of the individual and the community are the same process. In essence, growth of the community is interdependent on the willingness of the individuals to become involved.

> The fulfillment of individual life is in belonging with others who share the same purposes. In this relatedness an individual finds use for what is unique in him, responsibility which develops him, and a sharing which gives both glory and meaning to life.[6]

The following example points out how community efforts support and sustain all individual community members. Individual growth and benefits are achieved through group effort rather than separate and distinct actions of individuals.

> The unorganized territory of Heron Bay North required fire protection. Achievement would benefit all residents with safer conditions and lower fire insurance premiums. With no formal governing board to go to, residents took it upon themselves to organize a volunteer fire department. Their initiatives led to the building of a fire hall and assistance in acquiring equipment.

Similarities are seen in traditional practices in Indian communities. These communities are governed by the people in spite of the hierarchical governing process imposed on every Indian community by the Indian Act. The idea of electing a representative and giving power to that one person to speak for all others is a completely foreign concept to a traditional Indian community's thought process. It cannot be understood how one person with their reality can speak for all others.

> It is easier to care. . . if one believes himself to be, literally, part of it. . . . To see persons as alone, isolated, discrete and separate is both unpardonable arrogance and restricting humility. . . . He is both more than, and less than, what is implied by this view. He is more than this because he is, literally, part of a larger process. He is less than this because he is not ontologically separate from the larger category. He is a strand in the web of life.[7]

At the same time in the traditional northern Indian community there is complete respect for the individual. As viewed by an elder, the spirituality of the community is derived from the tree of life. The tree of life has many branches with many life-paths for people to follow. The choice of a life-path rests with the individual. Sometimes good things happen; sometimes bad things happen. Respect is given to the individual, and bad things encountered become learning experiences. No emphasis is placed on the bad. It is there and it exists; it is not given any importance. Bad experiences need to happen in order for learning to happen. The bad must be experienced in order for the good to be understood. In a similar vein, a member of a northern single industry community says. "If it were not for the losses this community has suffered, the fear of losing one's home due to industry shut downs, the residents may have taken their town for granted and thus not be aware of and/or take advantage of the wealth of knowledge and support which exists within this town."

These contextual patterning examples demonstrate that the context of northern resource dependent communities and Indian communities is different from more urban oriented settings. When the principle of contextual patterning is not understood by the human service professionals assigned to northern communities, conflict and misunderstanding can arise between the professionals and the community.

Given that these insights are valid, it is little wonder that professionalism and its bureaucratic structure present problems in these northern community settings.

> Can anyone, except as he is actually a part of a situation, make these delicate adaptations to the other persons involved that must be the basis for action?[8]

The next section of this paper thus looks at characteristics of human service organizations and Professionalism that impede operationalizing contextual patterning in the formal human service delivery system.

> Outsiders are hindered from appreciating and learning from rural people's knowledge by many forces. . . . power, professionalism, prestige, lack of contact, problems of language, and sheer prejudice. We have seen how they respond to the pulls of central location, convenience, opportunities for promotion, money, and power. But this is not all. They are also influenced by professional education and training.[9]

Current applications and consequent problems

The trend in formal human service organizations has been toward privatization and the development of community based boards. When this policy is operationalized in northern communities, the meaning of a community-based board is lost.

The following case examples from Northwestern Ontario, as depicted in Tables 1, 2, and 3, demonstrate that most human services are not directed by a local community board and when there is a board, the board often takes on a context of representing a cluster of communities that is geographically dispersed. Furthermore, the tables illustrate a variety of means of selecting board representation. In addition, the composition of what communities are clustered together to form a community based board changes for different human services.

TABLE 1: REPRESENTATION ON SELECTED HUMAN SERVICE BOARDS – LONGLAC

SOCIAL SERVICE	BOARD SIZE	REPRESENTATION
Adult Protective Services Worker	no board	operated by municipality
Canada Employment and Immigration	no board	federal government
Family and Children's Services	board of 20	2 district reps no local reps appointed, elected
Family Resource Centre	no board	operated by municipality
General Welfare	no board	operated by municipality
Association for Mentally Retarded	board of 15	2 reps in Longlac elected from membership
Income Maintenance	no board	provincial government
Indian Affairs	no board	federal government
Infant Child Development	no board	operated by municipality
Kinna-Aweya	must be native	elected from membership
Legal Clinic	board of 7	2 reps in Longlac
Longlac Day Care	no board	operated by municipality
Northern Affairs	no board	provincial government
Ontario Provincial Police	no board	provincial government
Probation and Aftercare	no board	provincial government
Salvation Army	board of 7	no reps in Longlac selected by interest
Thunder Bay District Housing Authority	board of 11	1 district rep members are federal, provincial, municipal appointees

*31% of selected social services are board operated.
*8% of selected social services have representation in Longlac.

TABLE 2: REPRESENTATION ON SELECTED HUMAN SERVICE BOARDS — GERALDTON

SOCIAL SERVICE	BOARD SIZE	REPRESENTATION
Adult Protective Services Worker	no board	operated by municipality
Canada Employment and Immigration	no board	federal government
Family and Children's Services	board of 20	2 district reps no local reps
Family Resource Centre	no board	operated by municipality
General Welfare	no board	operated by municipality
Geraldton Day Care Centre	no board	operated by municipality
Geraldton District Association for Mentally Retarded	board of 15	13 reps from Geraldton
Income Maintenance	no board	provincial government
Indian Affairs	no board	federal government
Infant Child/Development	no board	operated by municipality
Kinna-Aweya Legal Clinic	board of 7	1 representative
Native Community Branch	no board	provincial government
Northern Affairs	no board	provincial government
Ontario Provincial Police	no board	provincial government
Probation (Juvenile/Adult)	no board	provincial government
Salvation Army	board of 7	local representation
Thunder Bay District Housing Authority	board of 11	2 district reps 1 shared Geraldton/Longlac
Vocational Rehabilitation	no board	provincial government

*26% of selected social services are board operated.
*4% of selected social services have representation in Geraldton.

TABLE 3: REPRESENTATION ON SELECTED HUMAN SERVICE BOARDS — HEMLO AREA

BOARD/COMMITTEE	MANITOUWADGE	MARATHON	MOBERT	PIC HERON
Hemlo Area Coordinating Committee	none	none	none	none
Human Services Committee	none	none	none	none
Health T.B. Health Council	none	1	none	none
T.B. District Health Unit	1 alternate	1 alternate	none	none
Hospital Boards	local board	local board	none	none
V.O.N. Board of Directors	none	none	none	none
Education:				
Lake Superior Board of Educ.	3 (public) 2 (separate)	2 (public)	none	none
Nth. of Superior District R.C.	3 (# varies by assessment of residential wealth)	1 (# varies by assessment of residential wealth)	none	none
Social Services:				
Nth. of Superior Mental Health Bd.	2	2	none	none
Family and Children's Services Board	see (a)	see (a)	none	none
Regional Children's Centre	1 rep for T.B. District	1 rep for T.B. District	none	none
Corrections Committee	n/a	5	(3 reps shared)	
Family Resource Centre	2	2	(1 rep shared)	
Day Care	local	local	none	local

(a) The 18 municipalities in the District of Thunder Bay elect 5 members to compose the District Child Welfare Board. From this Board of five, two are elected annually to the F&CS Board.

The implications of these case examples presented in Tables 1, 2, and 3 are that a northern community has limited opportunity to participate in determining how formal human services are delivered to the community and what services come to the community. Overall, this human service organizational structure impedes any contextual orientation to service delivery. Thus, local community people have very little control over services that directly impinge on their personal lives. This is ironic when the predominant perception is that people do have control over such private matters as family, relationships, education, and health care.

The policy that governs the situations described in Tables 1, 2, and 3 originates in planning and policy divisions of the provincial ministries responsible for delivery of human services to northern resource dependent and Indian communities. The direction of the policy flow is depicted in Figure 3 where policy decisions originating in Toronto are sent to Thunder Bay (for social services there is another step — a regional office in Sault Ste. Marie), to clusters of northern communities or to a single northern community.

Opportunities to operationalize the principle of contextual patterning are again thwarted this time by policy originating outside of the community and policy that is filtered through several administrative levels before reaching a northern community where it is to be implemented.

The practice of contextual patterning is furthermore impeded by organizational and professional characteristics. The following examples, while not exhaustive can serve to illustrate these impediments to contextual relevancy.

Organizational characteristics

1. Hierarchical structure

The human service organizations that serve these northern resource dependent and Indian communities are characterized by a hierarchical structure. There is a top and a bottom; there is a superior and inferior position. This is a philosophical approach to the design of an organizational structure that reaches back to the ultimate dominance of the Aristotelian philosophy of ancient Grecian times.

> It is the world of either/or!. . . . everytime we separate an aspect of reality and turn it into an either/or there is an implicit superiority/inferiority meaning loaded into the classification.[10]

This style of organization contrasts sharply with the northern community networking system that is characterized by mutuality, horizontal relationships, and role diffusion.

2. Formal communication patterns

Likewise these human service organizations follow formal lines of communication. A new graduate of our HBSW program, thoroughly trained by one of the authors to practice contextual patterning in a rural community, came back after two weeks on the job with this to say about her experience.

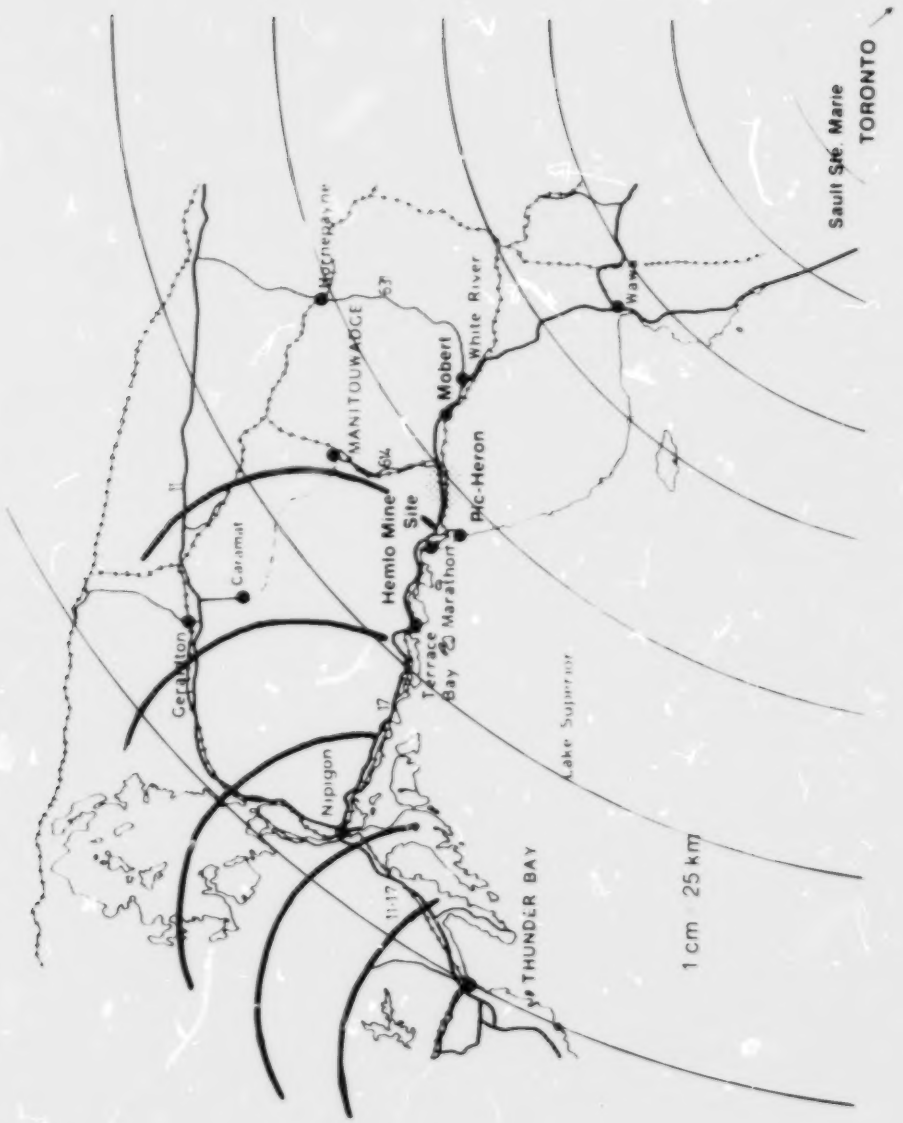


Figure 3. Policy flow for human services in Thunder Bay district

> I entered the community as you suggested. Remembering that the first most important task is to provide the community with opportunities to get to know me as a person and thereby, demonstrate my commitment to this community that is to be my new home. I volunteered as a Girl Guide leader. I searched out some old time fiddle players who are delighted to be able to give me fiddling lessons in 'old tyme music'. I talked to people on the street. Many of my best contacts have been made in the grocery store and the gas station. In contrast to these things that I am doing, my supervisor has given me this advice about how I am to be successful in my new job. If people have things to say to me, they are to make an appointment. He handed me an article describing phone etiquette for a professional. I am to say hello not hi; goodbye rather than bye or see you later.

Experiences of this new graduate describe the one-way flow of information in formal communication. This example reinforces how formal communication patterns militate against contextually focused opportunities for feedback. Such formal patterns reduce the effectiveness of frontline staff who deal with clients being served by the human service organization.

3. Division of labour that is governed by written rules, regulations and specialization

The following three quotes illustrate how segmentation of activities and limited accountability impedes a contextually appropriate response.

> We have become dependent upon pre-packaged, fragmented realities prepared by others for each of us to consume. . . . it is for the schools and the day-care centres to look after our children; it is for the doctors to make us healthy; it is for the marriage counsellors to build up and repair our marriages; it is for the supermarkets to prepare our foods; it is for the media to keep us informed; it is for the social security and housing and health systems' jobs to look after the aged; it is for the government to give us jobs and money. It is for the churches to make us holy; it is for the boss to give us a raise; it is for the labor or professional unions to negotiate us a better piece of the pie; it's for "Pollution Probe" to clean up the world; it is for our foreign aid programs to feed the Third World Poor. . . . And there we all are, all us, uniform, unitized, objectified, predictable, separated units within it.[11]

> People have attacked the problems facing Indians in many different ways. The effects almost invariably involve isolating certain problem areas such as alcoholism, mental health, children, land, water, tribal government and so on, and dealing with each individually. . . . When problems in a tribal community are dealt with in a bureaucratic, quasi-individual approach as though they were a collection of individual problems, the community begins to disintegrate.[12]

> Moreover, through the use of our linear fragmented approaches to decision-making, and we have all been trained to act so, we miss the ball game. We live in a world where each solution creates a new problem. Problem-solving and solution-making, within the current mentality becomes more and more evidently futile. . . . Thus a new lifestyle, whether we wish it or not, is being forced upon us by the bankrupt logic of material progress forever.[13]

4. Knowledge as the legitimate source of authority

Formal academic training becomes the first criteria for entry into the workplace. Responsibility is granted according to academic achievements and certification. This procedure places contextual experiences into a secondary position.

5. Obedience is to the office holder: not the person

Again, when the focus is put on a particular established position, the principle of contextual patterning becomes difficult to operationalize.

> Authority and responsibility go with function, but as the essence of organization is the interweaving of functions, authority, and responsibility we now see as a matter of interweaving . . . authority is inherent in the situation, not as attached to an official position . . . . this pluralistic responsibility, this interlocking responsibility, makes it difficult to "fix" responsibility.[14]

In summary, these characteristics of human service organizations that serve northern resource dependent and Indian communities impede the practice of contextual patterning.

Professional characteristics

Professionals who deliver human services are placed in a situation of having to carry out policies and procedures that are largely determined outside the community. The professional is accountable within the structural confinement of the organization and not to the local community. The pressure is to answer to the goals of the organization's requests rather than what are local community issues. Professionals are asked to be accountable in ways that have little impact on improving the quality of life within the community. They are asked to measure the number of client cases served as if they were measuring the depth of water, paying no attention to its contextual nature.

Likewise, the pressure is to provide measurable and "objective" evidence of job outcome. This organizational demand encourages professionals to collect data that describes short term and easily defined activities. This approach to evaluation of job performance may have little to do with the impact of the service on the client system. Thus, once again a contextually realistic picture is not provided. This situation is illustrated in the following quote about a biologist studying the characteristics of a species of fish.

> The Mexican Sierra has seventeen plus fifteen plus nine spines in the dorsal fin. These can easily be counted. But if the sierra strikes hard on the line so that our hands are burned, if the fish sounds and nearly escapes and finally comes in over the rail, his colours pulsing and his tail beating the air, a whole new relational externality has come into being — an entity which is more than the sum of the fish plus the fisherman. The only way to count the spines of the sierra unaffected by this second relational reality is to sit in a laboratory, open an evil-smelling jar, remove a stiff colourless fish from the formalin solution, count the spines and write the truth. . . . There you have recorded a reality which cannot be assailed — probably the least important reality concerning either the fish or yourself. . . .

> It is good to know what you are doing. The man with this pickled fish has set down one truth and recorded in his experience many lies. The fish is not that colour, that texture, that dead, nor does he smell that way.[15]

Furthermore, most professionals are trained in a problem-solving approach that begins the process of helping by determining the problem.

> To identify a problem is to partialize the context to obtain a focus for change. The process of partialization distorts any point in the context and thus undermines the ability to understand the holistic reality.[16]

In summary, these examples demonstrate that professional characteristics can impede the practice of the principle of contextual patterning.

Conclusions

We need to shake up our perspectives on what is appropriate in the delivery of human services in northern resource dependent and Indian communities. The practice of contextual patterning can enhance the relevancy of the type of human service provided in a community and the manner in which a human service is delivered.

> . . . our training and culture impose some conceptual baggage that stands in our way. . . If the only tool you have is a hammer, then you tend to treat every problem as if it were a nail.[17]

The reader may be thinking that what we have described here is merely good common sense. We won't argue with that point. What our experience and research has demonstrated to us is that while many of these ideas may seem intuitive and simplistic, the predominant characteristics of human service organizations and professionalism work against legitimizing within the delivery of formal human services those predominant ways of interacting, supporting, and helping so ingrained into the internal, but informal web of rural and Indian communities.

Northern universities have a unique opportunity to promote the principle of contextual patterning when educating future professional human service workers. For example, if we continue through our classroom teaching to judge the North from southern standards and guidelines, the North will continue to be viewed as lacking in resources. But how about flipping the analogy? What if the South was judged by the resources of the North? University educators of the North must support student learning that guides the student in viewing the community.

University educators must not too quickly conclude that our constituents are being better served if only we enroll and graduate more Indian and rural students. Our experiences have demonstrated to us that unless university instructors bring into the classroom principles and theories of practice more contextually appropriate we have ultimately changed nothing.

For example to merely train Indian Child Welfare Workers in the traditional models of child protection perpetuates a system that has failed to serve the needs of Indian people.[18]

The present system of child welfare has been described by Judge Kimmelman, Manitoba, as being "tantamount to cultural genocide". Even though this fact is widely acclaimed by Indian people our research indicates that the system is difficult to correct if the university educational system cannot provide alternate models.

Finally we would like to suggest some of the implications of contextual patterning for the educators of professional human service workers who need to be prepared for practice in northern environments. These suggestions support the investigation of J.D. Bates on the role of Lakehead University in meeting the educational needs of Native students.[19]

1. Context, rather than task, must be predominant in the educational process. Students must learn to understand and analyze the natural systems of interaction which form a community context. They must be taught fluidity; to weave in and through horizontal, interdependent relationships that compose the local community. They need to learn to practice non-interventive strategies.

2. Curriculum content focused on person/problem configurations must be the background rather than the foreground of human service education for the North.

> For example the profession of social work needs to give more serious attention to how to address the needs of people in a way that integrates context of practice into social work practice . . . . It does begin by acknowledging the synergistic effect of social work techniques and environment. A given social work method has distinct properties that are energized when used in a certain environmental context. The outcome is determined by the synergy of method and context.[20]

3. The value base of respect for diversity and self-determination leading to commitment to community control must be reinforced and demonstrated by instructors. While students need to learn appropriate patterns of professional behaviour, they must also thoroughly understand that merely operationalizing standardized and established practices can lead to contextually inappropriate responses to many human service needs.

4. Classroom teaching of practice theory and principles, and of management practices in human service organizations must be operationalized in the context of northern environments. All theoretical abstractions must be contextually operationalized to be made meaningful. It is often the traditional examples given in the class which distort practice from the northern context. As one of our Indian students stated, "Teach me within the context that I understand!"

5. The classroom must become part of the context. This involves bringing students to the rural environment and inviting that environment to become an active classroom.

Operationalization of the principle of contextual patterning demonstrated throughout this paper can provide the mechanism for a school of thought to truly become a university of the North.

Notes

1. Chambers, Robert. Rural Development: Putting The Last First. (New York: Longman Inc., 1983) p. 84.
2. Kelley, M.L., C.H. Nelson, and D.H. McPherson, "Rediscovering Support In Social Work Practice: Lessons From Indian Indigenous Human Service Workers" Canadian Social Work Review, p. 234.
3. Relph has developed a model displaying a continuum of choices that a person has for identifying with a community. The range is from existential outsideness to existential insideness. With this latter category being defined as a feeling of home, belongingness; and a deep identification with one place and awareness of being an outsider elsewhere. Relph, E., Place and Placelessness. London: Pion, 1976, p. 51-55.
4. Kelley, Nelson, McPherson. p. 246-247.
5. Waller, Adrian. "Uncle Ted' — the Animals' Best Friend," Readers Digest (September, 1976), p. 111.
6. Reynolds, Bertha, An Uncharted Journey: Fifty Years Growth in Social Work. (New York: The Citadel Press, 1963). p. 186.
7. DeFaveri, Ivan. "Contemporary Ecology and Traditional Native Thought," Journal of Native Education. p. 7.
8. Schwartz, William. "Bertha Reynolds as Educator," Catalyst. No. 11, 1981, p. 9.
9. Chambers, Robert. Rural Development: Putting The Last First. (New York: Longman Inc. 1983), pp. 71 & 83.
10. Dyson, William A. "People-Politics and People-Policies In Revolutionary Times", Family Services Association of America Biennial Conference at Los Angeles, California. (November 16, 1973), p. 8-9.
11. Dyson, p. 18.
12. Wilkinson, Gerald Thomas. "On Assisting Indian people," Social Casework, Vol. 61, No. 8, (October, 1980), pp. 451-452.
13. Dyson, pp. 24-25.
14. Follett, Mary Parker, Creative Experience. (New York: Longmans, Green, 1940.) pp. 149-155.
15. Peters, Thomas J. and Robert H. Waterman Jr., In Search Of Excellence: Lessons from America's Best-Run Companies. (New York: Harper & Row, 1982), p. 46.
16. Nelson, C.H. and M.L. Kelley, "Innovations In Northern/Rural Community-Based Human Service Delivery," Canadian Association of Schools of Social Work, Learned Societies Conference, Winnipeg, June, 1986. p. 5-6.
17. Whittaker, James K. and James Garbino. Social Support Networks: Informal Helping In The Human Services. (New York: Aldine Publishing Company, 1983) p. 47.
18. McPherson, D.H., "Proposal to Establish An Indian Child Welfare Authority" submitted to Ministry of Community and Social Services, April, 1986.
19. Bates, J. David. "Lakehead University and Native People — An Emphasis on Northwestern Ontario: Research, Education, Community Service," prepared for presentation at the Mid-North Universities Conference, Association of Canadian Universities for Northern Studies, (Sudbury, 13-14 June 1986).
20. Nelson, Kelley, McPherson, p. 6-7.

Lakehead University

THE IMPACT OF HOUSING SHORTAGES ON NORTHERN DEVELOPMENT: A CASE STUDY

James Stafford and Connie Nelson
Lakehead University

Abstract: A shortage of housing arises in all towns that experience rapid population growth, but this problem is exacerbated in resource-dependent towns by their size, isolation and fragile economic base. The effects of a housing shortage are examined in a case study of two communities in the Hemlo Gold Mine Area.

The thesis presented in this paper is that the housing policies of both government and industry in the Hemlo area have resulted in a housing shortage which discourages the establishment of service industries and spin-off businesses during the initial stages of growth. Entrepreneurs who are willing to set up enterprises on a shoestring are reluctant to do so when they discover a lack of available, affordable housing. If this deficiency were overcome the resulting expansion might serve to mitigate the bust effects that will inevitably follow when the mines close.

The authors describe the housing developments and identify four critical factors that contributed to a housing shortage in the communities of Manitouwadge and Marathon. Alternative solutions to the housing shortage are explored.

Résumé: Toutes les villes en croissance démographique rapide connaissent une pénurie de logements. Cependant, ce problème est aggravé par la petite taille des agglomérations tributaires de l'exploitation des ressources naturelles, par leur isolement et par la fragilité de leur infrastructure économique. Les auteurs font l'étude des répercussions de cette pénurie de logements dans le cas de deux agglomérations de la région de la mine d'or Hemlo.

Ils proposent leur hypothèse selon laquelle les politiques du logement, tant des autorités publiques que de la direction des entreprises de la région de la mine Hemlo, ont engendré une pénurie de logements décourageant l'installation des industries tertiaires et d'entreprises auxiliaires au cours des premières phases de développement. Les hommes d'affaires désireux de créer des entreprises à l'aide d'un capital minime hésitent quand ils découvrent qu'il n'existe pas, dans le voisinage, de logements à prix raisonnable. Si l'on pouvait remédier à cette difficulté, l'expansion qui s'ensuivrait permettrait d'amortir les effets du marasme qui suit inévitablement la fermeture d'une mine.

Les auteurs décrivent les activités de construction dans les agglomérations de Manitouwadge et de Marathon, mettent en relief quatre facteurs cruciaux qui ont contribué à la pénurie de logements, et étudient des méthodes pour y remédier.

A shortage of housing arises in all towns that experience rapid population growth but the problem is more severe in small, resource-based communities in remote areas. These

shortages are most acute during the early stages of growth in spite of the optimism that reigns during that period. Housing shortages discourage some of the potential development since entrepreneurs who are willing to set up their own enterprise on a shoestring discover they must first finance the construction of a home before starting their business.

Experiences in other resource-dependent communities have demonstrated that this resulting shortfall of small businesses and services continues to haunt the single-industry community throughout its limited lifespan. Residents must travel long distances to other communities to purchase basic commodities, creating a flow of money out of the community and a sense of community incompleteness on the part of residents. Later when the industry that forms the economic base of the community suffers a recession, the town feels the direct consequences. When the mill or mine finally closes down, the government steps in, as it has in the case of Atikokan and Elliot Lake, and spends millions of dollars helping the community adapt to its loss.

The thesis presented in this paper is that a housing policy that encourages the establishment of service industries and spin-off businesses during the initial stages of growth of a boom town may mitigate the bust effects that invariably follow. The argument begins with an examination of the housing situation in two communities affected by the Hemlo Gold Strike. Next, the authors look at the government and industry policies that influence the availability of housing. Finally, they suggest some solutions to the housing shortage that would not discourage potential entrepreneurs from locating in small, Northern communities during rapid population growth.

Background to the Hemlo Gold Mine development

The Hemlo area is located at the top of Lake Superior, snuggled against the Trans-Canada Highway and Ontario Hydro transmission lines (see Figure 1). There are also communities in the region where the work force and support industries can be located. The fact that an infrastructure was already in place before construction of the mines began makes Hemlo different from most mining developments in Northern Canada.

The Hemlo gold development has a long history. In 1869 a local Indian named Moses Pee-Kong-Gay first discovered an outcrop of the mineral that sparked on-again, off-again exploration and development that was to last for 110 years. Finally an extensive drilling program on a claim optioned to Corona Resources resulted in the gold strike of 1981. This was followed by a flurry of drilling activities and two more important strikes in the following year on property optioned to Lac Minerals and Noranda Mines. The three companies constructed gold mines which went into operation in 1985 (Patterson, 1984, p. 1). The mines tap a combined total reserve of 76 million tons of ore assessed at 0.24 ounces of gold per ton (Hart, 1985, pp. 8, 9; Stokes, 1985, p. 1). Present estimates place the value of the ore body at $6 billion U.S. and predict a life span of at least 20 years for the three existing mines. It is acclaimed as one of the largest gold ore bodies ever found in Canada (Knoll, 1984, p. 20).

The two communities selected by the mining companies for residential development are Manitouwadge and Marathon, located respectively 58 kilometers north and 45 kilometers west of the mine sites. Manitouwadge was established in 1954 when two copper and zinc mines were opened in the vicinity. The Ontario Paper Company located its Woodlands

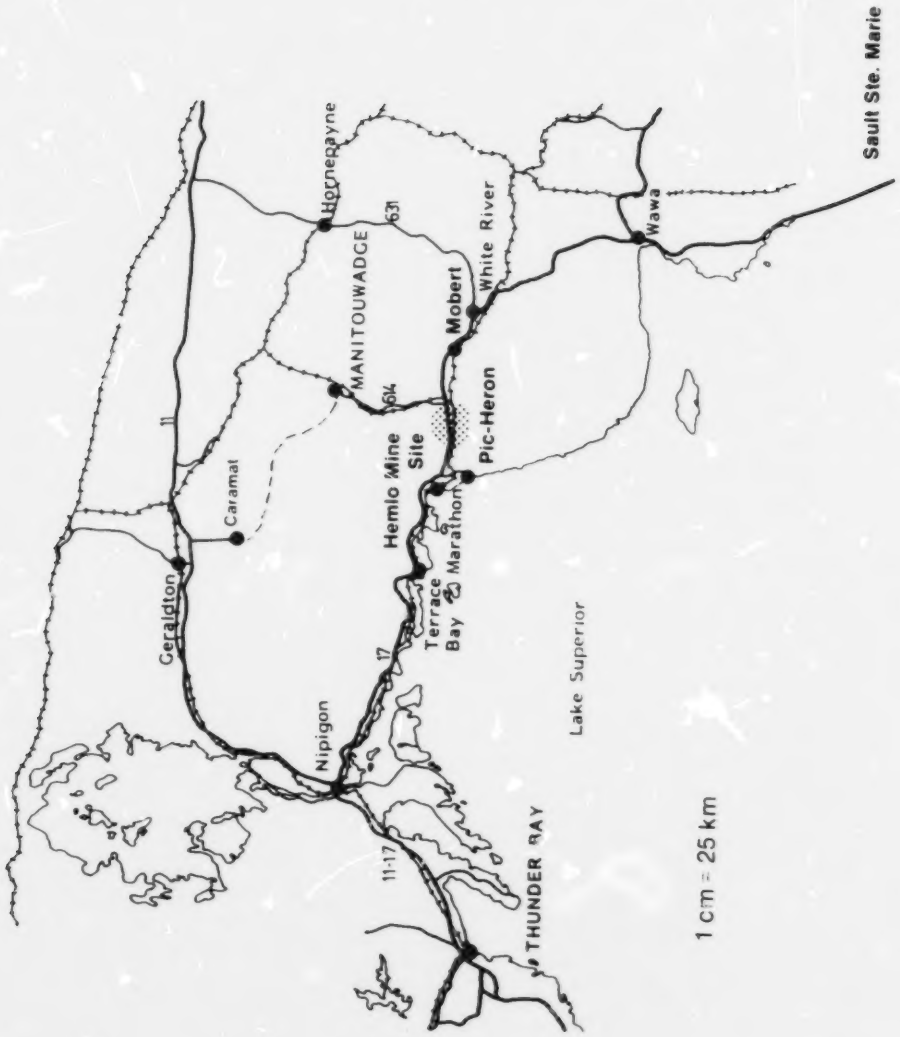


Figure 1. Study Area Map

Division there in 1968 and the American Can Corporation moved many of its Woodlands employees into Manitouwadge in 1975–1976. The economic base of the community is consequently spread over the two resources of mining and forestry although the Geco Mine owned by Noranda is the major source of employment.

Marathon sprang up in 1944 when the Marathon Company of Canada constructed a kraft pulp mill at the edge of the townsite. The mill, which is now owned by James River Corporation has been the primary source of employment for town residents ever since.

Both towns expect considerable population growth as a result of the Hemlo developments. Manitouwadge, which had a population of approximately 3,200 in 1981, is expected to grow by 40% to 4,500 by 1989. Marathon will experience a greater proportionate increase. Its population is expected to increase from about 2,300 in 1981 to 4,200 in 1989, an increase of 83%.

The pre-Hemlo housing situation

The availability of housing in the two towns was limited even before Noranda announced its intention to construct a mine. Manitouwadge had started developing a subdivision in 1973. About 25 of the 70 lots remained unpurchased. However residents were reluctant to make this kind of long-term investment. The housing market was depressed by uncertainties as to the life of the mine and by the availability of subsidized housing provided by the major employers: Noranda, Ontario Paper, James River, and the Hudson's Bay Company store.

A similar situation existed in Marathon. Couchie (1984, p. 6) points out that housing has always been a problem in the town for those who did not work for an employer that provided accommodation. Even though houses may have been on the market, they were often too expensive for potential buyers and not available for potential renters.

When the mining development began, the provincial cabinet decreed that the Ministry of Northern Development and Mines be the lead ministry to coordinate planning for the needs of industry, the local communities, and other government agencies. To aid in this task, the Hemlo Area Coordinating Committee (HACC) with a membership of six provincial ministries was formed in September, 1982. HACC's main objectives are to establish a liaison between the province, the communities and the mines, to familiarize new or expanding firms with government procedures for development, to identify any potential problem areas that may delay development, to coordinate the activities of all levels of government, to ensure that human services are in place to meet the needs of an increased population, and to identify the amount of provincial investment that will be required.

One of the first actions of HACC was to set up development guidelines for the Hemlo area. The thrust of the guidelines is to direct and control residential and commercial development, as is evident in the following excerpts:

1) No new townsite to be created in the area.
2) All new permanent housing to be located in the existing municipalities only.

3) All new commercial and industrial enterprises will be directed to existing municipalities. New developments outside municipal boundaries will be limited as to extent and type.
4) New development along the Highway #17 corridor will be restricted to service road concepts only.
5) Patented lands within municipalities will be given top priority for development.
6) Permanent bachelor housing shall be located in the existing municipalities.
7) Temporary exploration camps and/or construction camps may be permitted on site.
8) Area municipalities will be encouraged to set aside sufficient land for mobile home subdivisions and for single (bunkhouse or bachelor) accommodation.
9) If the mining companies develop their own subdivision, a percentage of lots should be made available at market value for non-company employees.
10) Temporary construction workforce trailers not located at construction camps will only be permitted at provincial and private campgrounds subject to campground regulations.

The principle behind these guidelines was orderly, efficient development. The restriction of development to established municipalities guaranteed that municipal councils and by-laws would act to eliminate ramshackle buildings laid out in a random manner. It also guaranteed the government that the location of all new developments would minimize the cost of delivering an infrastructure to these facilities. On the other hand, the guidelines required the Ministry of Municipal Affairs to police activities to ensure adherence to the guidelines. This was a challenge since a number of illegal trailer parks sprang up and in at least one case the Ministry had to take the owner to court after pressure and threats proved ineffective.

These HACC guidelines allowed the mining companies to choose the location of their residential development. The three reasonable choices were Manitouwadge, Marathon, and White River, the last-mentioned situated 48 kilometers east of the mine sites. Since White River was smaller, with a population of 1,000, and lacked a secondary school and a hospital, the choice was quickly narrowed to Manitouwadge and Marathon. Manitouwadge was already dominated by Noranda, which fact influenced the decisions of all concerned. Noranda decided to build in Manitouwadge while Lac Minerals and Teck-Corona, neither of whom wished to locate in a Noranda town, chose Marathon.

Housing during the construction stage

The construction stage is often the most disruptive part of growth because it occurs first, before the townspeople have adjusted to growth, and because services and facilities are not yet in place to accommodate the increase in population. This stage requires the sudden influx of a large number of itinerant workers, most of whom will move on when their job is done. Thus, the nature of the construction phase lends itself to conflicts and social crises.

Hemlo construction took place in three areas: the mine sites, Manitouwadge, and Marathon. Trailer facilities were set up at the mine sites in accordance with HACC guidelines. Lac Minerals employed 325 construction workers, Noranda, 1,100, and Teck-Corona, 225, for a total mine site construction workforce of 1,650 (Northern Ontario Business, 1984, pp. 34, 35). This large number could have had a significant impact on the communities, but did not. It was totally self-contained with housing, eating, laundry and recreation

facilities at the campsite. In addition, the men were employed on a rotational system that had them working long hours every day for a period of time, followed by an extended break when most of them left the area for their homes. The O.P.P. and the mine officials cooperated in dealing with the occasional troublesome worker by dismissing him from his job. All of these efforts combined to minimize the impact of the 1,600 mine site construction workers on the established communities. There were cases of trafficking in drugs and prostitution but these were generally not visible to the townspeople, or were not so offensive because they took place outside the town boundaries.

The residential construction activities in Manitouwadge and Marathon could not be so easily hidden, but the work forces were much smaller. Dumbrell and Butler (1985, p. 8) estimate that 150 men were employed in the construction of houses in Marathon. If this is accurate then perhaps 100 or less would have been employed in Manitouwadge. This group had considerable difficulty finding suitable accommodation and often had to pay exorbitant prices for whatever they could find. They rented rooms in homes, hotels, motels, and trailers. Those who owned trailers pulled them behind motels and onto trailer parks along the highway. Others commuted from neighbouring towns. As a last resort, some pitched tents near the construction site.

The disruption arising from these smaller numbers was not extensive. Town residents complained of the traffic congestion, of new faces in the bar, and of lineups in the stores, but did not suffer an excess of inconveniences. The police had to deal with new and different misdemeanors while the Ministry of Municipal Affairs was at times busy with cases that violated HACC guidelines, but the overall impact of rapid growth during the construction period in the Hemlo area was not disruptive.

Housing for mining employees

In the past, mining companies have had to provide accommodation for employees because they wanted their employees domiciled close to the place of work. Since ore deposits tended to be located in isolated areas, residences had to be constructed along with the mine. Private companies were reluctant to invest in housing under the conditions of uncertainty associated with the mining industry, leaving the mining companies to cover these expenses.

Company housing had advantages for the employer. It could exercise discretion as to the timing, quantity, and type of accommodation. Home ownership also allowed the company greater control over community affairs and provided it with a tool for maintaining a stable, experienced workforce. A number of policies have been established whereby companies provide homes to employees at a reduced cost or offer them economic incentives to remain in the community for a long period of time. Some of these policies include:

1. Reduction in the real cost of the home through provision of smaller structures with opportunities for the employee to contribute to the construction;
2. Subsidization of costs of lot and lot development;
3. Sale of house at a reduced price;
4. Mortgages with reduced interests rates;
5. Mortgages that are forgivable as a function of employee tenure;
6. Provision of monthly housing allowances;
7. Payment of utilities and/or taxes by the company.

(Pinfield, 1982, p. 40)

Manitouwadge

The decision to construct mines precipitated a flurry of activities including those directed towards the provision of housing for miners in the two communities. In Manitouwadge all 25 available lots were snapped up, 20 by Noranda and five by the township. Although Lac Minerals intended to house its employees in Marathon, it took steps to obtain some housing facilities in Manitouwadge. Some of Lac's personnel had ties in this community stemming from the days when it owned the Wilroy mine. Although the mine had subsequently closed, the company retained ownership of four apartment buildings containing 48 units. It proceeded to evict tenants from the apartments and to purchase one house in Manitouwadge.

Noranda requested that the town quickly build a new trailer park but when the township council complied it found itself mired with debt problems that involved provincial levels of government (Ontario, 1983, p. R716). At the same time it proceeded to develop two new housing subdivisions, one of which was illegal. Construction on the first subdivision with a capacity for 119 units began in the spring of 1984. A second subdivision with a capacity for 75 units was begun in 1985.

Noranda is involved in the bulk of the new housing developments. By 1988 company officials plan to have built 230 houses and 70 apartments for a total of 300 units. They forecast a labour force of 320 by 1989. The 300 units should meet Noranda employee housing needs assuming that some employees will share accommodation while others will already be living in the town when they are hired.

As residents of a mining town, the people of Manitouwadge are already accustomed to a subsidized housing market. Noranda has built 560 houses for employees working in the Geco mine and rented them out at reduced rates of about $130 to $140 per month. In 1972 Noranda began selling these homes to ten-year residents at low prices. Three hundred had been sold by 1985. The 1985 price is about $14,000.

Noranda is pursuing a different policy in its provision of subsidized housing for Hemlo employees. It allows employees to purchase homes at prices of $30,000 to $33,000. After making a minimum downpayment of $1,500 the employee receives a loan from Noranda, equivalent in value to the balance of the price of the home. The loan is amortized over 25 years at 12% interest. After 10 years residence the employee may pay off the balance of the loan. If his employment with Noranda terminates before the ten years are finished, the company buys back the house at the basic purchase price. That price is increased by 4% per year, to a maximum of 20%, after year 6 of the 10-year period. If the employee wishes to sell after the 10-year period, he must give Noranda first right of refusal on any *bona fide* offer.

Marathon

All three companies influenced the housing market in Marathon although only two of them planned to locate their employees there. Noranda purchased six houses, Lac Minerals, ten, and Teck-Corona one. Thus, seventeen homes were removed from the market by the mining companies upon commencement of construction activities.

A new housing subdivision, Penn Lake Flats, was quickly approved and developed. It is designed to hold 577 lots, providing a mix of single-detached and semi-detached homes, mobile homes, and apartments. In total, the subdivision has the capacity to contain 886 dwelling units, which exceeds anticipated needs.

By the summer of 1985, Lac Minerals had purchased 100 lots for single-family dwellings, 33 lots for mobile homes, and had built four apartment buildings with a total of 96 units. Further construction was planned for 1986 when it expected to have a workforce of 330 employees. This number was scheduled to rise to 600 by 1989.

Lac constructed 46 houses for sale to employees and is selling the remaining 54 lots to employees who will arrange for the construction of their own homes. The Company is offering a housing purchase assistance program to employees who purchase houses or lots. It provides financial assistanc for legal and survey fees to a maximum of $800. The employee must put up a minimum downpayment of 5%. The Company provides first mortgage financing to a maximum of $37,500, amortized for 25 years at current interest rates. It also provides an interest free, forgivable second mortgage to a maximum of $25,000. This mortgage is forgivable over a ten-year period commencing on the first anniversary, year two through year eleven, as follows: year two through year six, 5%; year seven and eight, 10%; year nine, 15%; year ten and eleven, 20%.

Lac Minerals also provides assistance for those who wish to use their own labour power in building all or part of their home. The Company provides a mortgage of up to $25,000 towards the construction costs of the house.

The Company has an option to purchase the home when the home-owner ceases to use it for his own accommodation, or ceases to work for Lac except in cases of disability, death, and retirement. Thus the homes built with Company assistance are assured of remaining accessible to Company control.

Rental rates in Lac Minerals apratments are subsidized to a lesser degree. Monthly rates vary from $285 per month plus utilities for a studio suite (531 sq. ft.) to $425 per month plus utilities for a large two bedroom apartment (822 sq. ft.).

Teck-Corona has built 80 single-detached homes. It has also purchased 20 mobile home lots and constructed two apartment buildings containing 48 units. These facilities should be adequate to meet the housing needs of the 174 employees expected to be on the Company payroll.

The employee housing assistance program of Teck-Corona is very similar to that of Lac Minerals. Teck built homes and sold them to employees for prices ranging from $62,700 to $84,000, the latter price being for homes of 1,264 sq. ft. with a carport and fireplace. The average price is about $70,000. The purchaser is required to put 5% down, and may take out a second mortgage of up to $25,000. The second mortgage is forgivable at a rate of 10% per year.

Teck sold its mobile home lots to employees for $11,500. The employee is required to pay 10% down and can take a ten-year forgivable mortgage on the remainder.

Thus the three mining companies made certain that the two communities would provide housing for their employees. The accommodation was available at subsidized rates and with forgivable mortgages to encourage long-term employment with the companies. Employees who took advantage of the forgivable mortgages signed agreements that allowed the companies to retain control of the ownership of the houses for long periods of time.

Housing for non-mining personnel

The sudden demand for housing in a market that had always been tight pushed prices up to levels beyond the budget of many potential newcomers who were not employed by the mines. Couchie (1984, p. 7) quotes cases of mobile homes and older houses being rented for $1200 per month. Tenants of rental units were particularly vulnerable to the shift in market conditions as they found their household units sold to buyers who wanted immediate occupancy. In other cases, families moved into Manitouwadge to set up a business only to find themselves shunted from trailer to house to trailer, never able to remain in one location for a period longer than three months. Two other new businessmen had to live in the back of their taxi stand in Manitouwadge because they could not find accommodation. The hospital administrator in Marathon moved his family, including five children, into a one-bedroom apartment where they lived for five months until the construction of their new home was completed.

The residents of Marathon circulated a petition which articulated their concerns about shortages of rental accommodation and about opportunities to purchase lots in the new subdivision. They invited a C.B.C. investigative reporter, Dale Goldhawk, to come and discuss housing problems with them and to publicize their difficulties. He taped an episode which was broadcast on C.B.C. in March, 1984 (MacBean, 1984a, p. 20).

Marathon residents also approached their provincial legislative representative, Jack Stokes, who assisted them in investigating the possibilities of the construction of rent-geared-to-income apartments by the Ontario Housing Corporation. If such apartments could be built, persons needing them could move out of the ones they currently occupied, freeing them for others who could afford them (MacBean, 1984b, p. 7).

The Ministry of Housing carried out surveys in both Manitouwadge and Marathon during the summer of 1985. The Ministry expanded the survey in Marathon to include households of single persons and couples without dependents. Ministry officials felt justified in going beyond the mandate to include these two groups because of the concerns expressed by members of the community. The survey tapped 45 respondents in households of these two categories. Unfortunately the methodology used in the survey did not allow the Ministry to determine the extent to which there was a need for households for people in these categories (Ministry of Housing, 1985b, p. 19). However, the fact that so many volunteered responses suggests that a need for rental housing exists for these two groups. The two surveys also showed a substantial demand for both rent-geared-to-income and market accommodation for elderly persons and for families with dependents (Ministry of Housing, 1985a, 1985b).

The most significant statistic is not available: the number of persons who would have set up businesses in Manitouwadge or Marathon but did not because of the lack of suitable accommodation. A considerable number of entrepreneurs visited the towns, made

representation to the township councils, and asked questions about the price of commercial and residential space. Most of them did not follow up with investments, the reasons for which we do not know. One significant reason is almost certainly the difficulties in finding accommodation. Many who did start businesses did so with a minimum of capital. Those who did not were also likely to be short of money and thus in a position in which they could not afford to set up a business and pay for a lot and the construction of a house at the same time.

The shortage of housing has a damping effect on the economic growth of the town. The absence of businesses and services forces residents of the two communities to travel considerable distances to purchase some of their necessities. A shopping trip out of town is often a welcome respite from the same, familiar environment, but when it is made regularly to buy basic supplies that could be provided in communities of this size, it represents an unnecessary drain of community finances.

The narrow economic base also increases the town's dependency on the major, local industry. No alternate sources of community income are available when layoffs at the mine or mill take place. A reduction in employment income immediately curtails spending in all other enterprises. When the single industry closes down, the entire local economy withers. Workers turn to unemployment insurance, families turn to welfare, and the government steps in to aid in the adjustments. All of this costs the provincial taxpayers millions of dollars.

Solutions

The implication of the foregoing discussion is that housing shortages in rapid-growth, resource-industry towns hamper potential growth and ultimately cost all of society in terms of money and human welfare. However the appropriate solution to this problem requires a careful scrutiny of the critical, underlying factors. One cannot dismiss such intangibles as the reluctance of town councillors to allow less expensive housing to be constructed because of "the type of people it will attract." Nor can one ignore the complacency of small towns regarding their economic vulnerability, a perspective fostered by the domination and control of the large company associated with the town.

However, a focus on actions rather than attitudes allows a more concrete analysis. Housing shortages exist because the type needed by non-mining personnel has not been constructed. Entrepreneurs, many of whom are willing to start businesses on a shoestring during periods of rapid growth, need rental housing because they cannot afford the combined cost of starting up a new business and making the down payment on a new home.

The shortage of rental housing is not unique to resource towns, but is critical across most of Canada. Since the question posed here is specific to single-industry towns, we shall extricate these factors from the ones dealing with the national problem that have already been analyzed in the housing literature (Fallis, 1980; Rose, 1980; Hulchanski, 1984; Steele, 1985). The four factors identified here as leading to rental housing shortages in Marathon and Manitouwadge are a) a depressed housing market created by the housing policies of the major employers, b) housing shortages created by the mining companies when the Hemlo development began, c) restrictions on development placed by HACC, and d) the isolation and economic instability of the towns.

The price of housing in the two towns was artificially depressed by the subsidization policies of the major employers. This provided inexpensive housing for most of the residents and reduced the willingness of others to pay market prices. In Manitouwadge, Noranda provided subsidized housing in the form of reduced rent and sales prices. James River and its predecessors had pursued similar policies in Marathon. This had the effect of reducing the price of housing throughout the towns because people were reluctant to pay more than their neighbours for similar housing. The low rates of rent discouraged builders from constructing housing units in the town without the assistance of one of the big companies.

Thus, when the goldstrike occurred, little rental accommodation was available. The shortage was exacerbated by the actions of the mining companies which proceeded to purchase all available lots and houses in the two towns and to evict tenants from apartments in Manitouwadge.

At the same time that housing was rendered scarce in the two towns, HACC placed restrictions on residential development outside of them. Historically fringe area development has often occurred on the outskirts of rapid-growth towns. Although unsightly and substandard, this type of development has provided accommodation for non-mining personnel when no other was available.

The most important factor hindering construction of rental housing in these two towns, and in all isolated, resource-industry towns, is their uncertain future. Fluctuations in demand for the resource combined with certainty that it will someday be exhausted make these towns very risky places for investment.

Given the unwillingness of the construction industry to invest in rental housing in large cities, it is little wonder that extreme shortages of such accommodation occur in mining towns. Shortages of housing, especially rental housing, are an inherent aspect of such communities. They are caught in a trap of incomplete development. Housing shortages discourage economic diversity which in turn discourages the construction of housing. Eventually, the self-fulfilling prophecy is realized when the single industry pulls out and no other businesses are available to sustain the existence of the town.

A solution to the housing problem in the Hemlo area that is economically feasible requires modification of one or more of these factors. The mining companies might be discouraged from subsidizing the housing of their employees. The restrictions on housing might be relaxed; or efforts might be made to diversify the economies of resource towns.

The activities of the mining companies might be discouraged, so that prices would be set by the market. However, the advantages of this approach are not apparent. Housing costs would be higher, labour turnover might be greater, and neither the company, its employees, or the community would benefit. This policy might have long term benefits, but on the surface does not appear to be the answer.

The second alternative, the relaxation of government restrictions is even less appealing. The uncontrolled growth of shanty housing along highways does not add to the quality of life and increases government expenses as it attempts to provide the usual services such as sewage, water, roads, electricity, school bussing and fire protection.

One thing that HACC might have done was to develop guidelines to allow approved fringe area development in the two towns. Given the expanse of wilderness and land surrounding the towns, some subdivisions might have been constructed with only roads and electricity provided by the municipality. The lots could be larger and residents might be able to enjoy a more natural environment without any additional expense to the municipality. This might make the towns more appealing places to live for some residents.

The problem of housing is tied up with the larger problem of economic diversity and long-term stability of single-industry towns. This lack of viability is both the cause and the effect of housing shortages. The elimination of such shortages would encourage more investment in the community which would then stabilize and extend its long-term economic future.

The Ontario government will someday be faced with the winding down of Manitouwadge and Marathon, a process with which it has already dealt in other towns at considerable expense to Ontario tax-payers.

Provision of assistance at the time of rapid growth rather than decline might be a more effective method of sustainment. Government programs are already in place to assist entrepreneurs wishing to set up small businesses. An expansion of these programs to provide housing assistance in rapidly growing communities would make the location of such businesses in these towns more attractive to the entrepreneur. This would help to broaden the economic base, expand the provision of local services and consumer goods and provide more jobs in the community. The total cost to the government of such a program might be far less than that of the present policy of dealing with the town while it is in decline.

Conclusion

The Hemlo goldstrike has provided an opportunity to analyze housing problems in rapid-growth resource towns. Both Manitouwadge and Marathon were already influenced by the housing subsidies offered to employees by Noranda and James River respectively. The goldstrike created an immediate housing shortage as the mining companies purchased available houses and vacant lots, evicted tenants from apartment buildings, and commanded the resources of the construction industry to build employee housing. Government restrictions, designed to bring order to the rapid development, eliminated random housing growth that traditionally accompanies such mining ventures.

The boom attracted a number of would-be entrepreneurs, but for one reason or another most of them did not follow through with the establishment of businesses. Since many did not have very much capital, a safe guess is that lack of low-cost housing or rental accommodation discouraged several of them from following through with investment in either of the two towns.

The argument expressed in this paper is that a shortage of housing limits the growth of resource based towns, rendering them dependent on the one industry for which they were established. Once that industry closes down, the town cannot sustain itself because of the lack of alternate industries.

A floundering resource town requires considerable assistance in the form of welfare and unemployment insurance payments, loss of tax income, and retraining expenses. It is here

suggested that financial incentives provided at the time of rapid growth would be much more effective than during the period of decline. If small businesses could be encouraged to move into rapid-growth, single industry towns with the aid of standard, small business assistance programs that are already in place, combined with the added incentive of housing assistance, these towns might be more viable and better able to withstand the withdrawal of the single industry when it leaves.

List of References

Couchie, E. (1984). Citizens' concerns and assumptions about the effects of the Hemlo development on the communities of Marathon and Heron Bay. Department of Secretary of State, Ottawa.

Dumbrell, J.W. & Butler, R.W. (1985). Identifying and assessing the impacts of the Hemlo gold development on the community of Marathon, Ontario, paper presented at the International Association for Impact Assessment Conference, Calgary, September, 1985.

Fallis, George B. (1980). Housing Programs and Income Distribution in Ontario. Ontario Economic Council, Toronto.

Hart, Matthew (1985). Golden Giant: Hemlo and the Rush for Canada's Gold. Douglas & McIntyre, Vancouver.

Hulchanski, J. David (1984). Market imperfections and the role of rent regulations in the residential rental market. Research study No. 6. Commission of inquiry into residential tenancies, Government of Ontario, Toronto.

Knoll, Kerry (1984). The lesson of Hemlo: Persistence pays off. Canadian Mining Journal, 105(4), 20–35.

MacBean, Debbie (1984a). Goldhawk visits Marathon. The Marathon Mercury, March 7, 1984, p. 20.

MacBean, Debbie (1984b). No relief in sight for housing shortage. The Marathon Mercury, April 11, 1984, pp. 1,7.

Ministry of Housing (1985a). Assisted housing survey, Township of Manitouwadge, October, 1985, draft, Thunder Bay.

Ministry of Housing (1985b). Assisted housing survey, Township of Marathon, October, 1985, draft, Thunder Bay.

Northern Ontario Business (1984). 5(2).

Ontario, Legislative Assembly of (1983). Hansard, Standing Committee on Resources Development, Estimates, MMAH, December 8, 1983.

Patterson, G.C. (1984). Field Trip Guidebook to the Hemlo Area, Ontario Geological Survey. Miscellaneous Paper 118.

Pinfield, Lawrence T. (1982). Housing strategies of resource firms in Western Canada, Canada Mortgage and Housing Corporation, Ottawa.

Rose, Albert (1980). Canadian Housing Policies: 1935-1980, Butterworths, Scarborough.

Steele, Marion (1985). Canadian Housing Allowances: An Economic Analysis, Ontario Economic Council, Toronto.

Stokes, Jack (1985). The Hemlo gold discovery and its effects on Northern Ontario, address to the Canadian Club, Thunder Bay, September 23, 1985.

TO SPRAY OR NOT TO SPRAY? THE ROLE OF EXCLUSIVE DISCOURSE IN THE CANADIAN SPRUCE BUDWORM CONTROVERSY

Jeremy Rayner
Department of Political Studies, Lakehead University

and

David Peerla
Department of Sociology, Lakehead University

Abstract: Attempts to control spruce budworm outbreaks in Eastern Canadian forests have generated considerable public controversy. The authors argue that a neglected result of the controversy has been the attempt by professional foresters to use the threat to softwood supplies posed by the budworm epidemic to advance their professional interests. The discourse of forest management is shown to function as an exclusionary discourse, defining the budworm outbreak in such a way that it can only be solved within the framework of forest management. Using the development of the bacterial insecticide *Bt* as a case study, the authors identify the pressures on Canadian foresters to compromise management goals and explain the failure of the foresters' exclusionary project in terms of the dominant structural interests in Canadian forest exploitation.

Résumé: Une controverse publique considérable a été causée par les efforts d'éradication des foyers de tordeuses des bourgeons de l'épinette dans les forêts de l'Est canadien. Les auteurs soutiennent que cette controverse a facilité en sous-main l'action des spécialistes forestiers désireux d'accroître leurs avantages professionnels face aux risques que cette tordeuse fait courir aux ressources en résineux. Leur argumentation est qualifié d'exclusiviste par les auteurs, car elle suggère surtout que la destruction des foyers de tordeuses relève exclusivement des méthodes d'aménagement forestier. En se fondant sur le dossier de l'insecticide à base de Bacillus thuringiensis, les auteurs mettent en évidence les pressions qui conduisent les spécialistes forestiers canadiens à altérer leurs objectifs d'aménagement, et expliquent l'échec de leur projet exclusiviste en fonction des intérêts organiques dominants du secteur de l'exploitation forestière au Canada.

The spruce budworm has established itself as one of the major enemies of the Canadian forest industry. Already threatened by a wood supply crisis which has been attributed to poor forest management practices,[1] the industry in Eastern Canada became aware in the nineteen-seventies that its remaining harvestable stands of spruce and balsam fir were in jeopardy. The budworm, a defoliator which actually prefers fir to spruce, is endemic to the boreal forest at levels which pose no threat to industrial exploitation. However, records show that every seventy years or so populations explode to epidemic proportions,

collapsing again only when the food supply has been exhausted. In recent years, such cycles have been occurring more frequently and remaining at the epidemic stage for longer. New Brunswick has endured a major budworm outbreak for more than thirty years promoting suggestions that modern forestry practices, including repeated applications of insecticides, could actually prolong a budworm outbreak indefinitely by protecting the food source.[2]

Large-scale aerial spraying of insecticides to protect the forest against the budworm has generated political controversy in eastern Canadian provinces from Newfoundland to Ontario. Each year the formulation and implementation of a spraying plan by the provincial ministry or department responsible for natural resources has provided the focus for a variety of groups seeking to influence policy. On the surface, the number and variety of such groups is confusing. Representatives of both industry and unions have generally argued for more spraying and for the use of more potent insecticides on the grounds that jobs are at stake. Against them have been arrayed a variety of anti-spray groups, largely but not exclusively environmentalist in outlook, who have often sought to widen the issue from spraying to the more general question of public input into the management of Crown Lands.[3] Governments themselves have moved cautiously, vulnerable on the one hand to charges of contributing to unemployment (often in already economically depressed areas) and, on the other, to poisoning their own citizens. In general, they have sought to increase their own control over forest management decisions, offering increased security of tenure to the forest companies in return for expanded surveillance of company operations. On the spraying issue itself, governments have tried to insist on closer coordination between spraying operations and company harvesting plans.

At the heart of the spray controversy lies the question of legitimacy: who should have the right to make a decision of this kind? In consequence, the importance of the annual contest over the spray plan lies less in what is actually resolved than in how the decision was reached. Victory or defeat for each group is determined not so much by whether they achieve their objectives in expanding, contracting or halting the spray, but in the extent to which they make or lose ground in establishing their right to make public policy. Obviously the two are linked: we would expect a group whose participation was accorded high legitimacy to be able to realize its objectives more easily than one with a lower level of legitimacy. But an exclusive concern with observable interest group activity, particularly with victories and defeats, overlooks the extent to which much of the ability to influence a decision rests on establishing a legitimate role. The analysis of legitimacy raises two particular problems which provide the focus for what follows. It leads us, first, to investigate the resources available to a group seeking to establish its legitimacy within the constraints of a particular social structure. And it brings into prominence, secondly, groups whose members may be scattered in a number of different locations but who share an interest because their legitimacy derives from a common role. In the case of budworm spraying, professional foresters are a critical example of this kind of group.

The crisis and the structural interests

Part of what we mean by the contribution of social structure to the legitimacy of groups has been analysed by Robert Alford using the concept of the structural interest. We shall follow Alford in arguing that an exclusive concern with observable interest group activity must be supplemented by an account of the "structural interests" at work for a more complete explanation.

> The distinction must be made between the organized action of a group to represent its interests (an "interest group") and those interests served or not served by the way they "fit" into the basic logic and principles by which the institutions of a society operate. . . I shall call the latter *structural* interests.[4]

Structural interests are further distinguished as *dominant*, *challenging* and *repressed*. The dominant interest is one which benefits from the prevailing rules and practices, in part because of its control over the interpretation and application of these rules in particular cases. A challenging interest is one which, for a variety of reasons, is able to contest the prevailing interpretations which privilege the dominant interest or even to change the rules themselves. A repressed interest is one which, in addition to not being served by the prevailing rules and practices, is in large part unable to articulate its own interest. A repressed interest is therefore very difficult to mobilize politically.

There is, however, a weakness in the theory of structural interests. As it stands, the argument is heavily reductionist in form and there is a danger that the activities of groups and individuals will be reduced to epiphenomena fully determined by structural constraints which are beyond their comprehension. Now, although it is quite possible to imagine social systems or structures whose overall consequences are unintended by or even beyond the comprehension of individual agents — a market is an example of such a system — this is not to say that the intentions of agents are unrelated to the outcomes of their actions. Any explanation of the system that results must include a reference to agents' intentions in context, even if only to show how they misconceived their relation to the system as a whole. This is particularly true in the case of legitimacy which can only affect action if it is self-consciously used by agents themselves.

It is precisely to avoid structural reductionism of this kind that we need to involve "mediating frameworks" which link structure and agency.[5] In other words, the relationship between deep structural interests and surface interest group activity is not a simple causal one. Structure is mediated through at least one more level, a level at which the institutions of society are embodied in beliefs and values which must, by definition, be accessible to individual agents. Alford himself has noted this in a later work, arguing that "the translation of class interests (or a cultural consensus) into organisational form and then into action is problematic and contingent."[6] It is precisely the problems and contingencies which need to be analysed and it is our intention to complement the account of structural interests with an analysis of cultural mediation, the competing discourses in the budworm spray controversy.

The concept of cultural mediation is therefore the focus of our own analysis, and it may be defined as "the continuous attempt by groups and organizations to construct symbolic representation of their legitimate role".[7] We hope to avoid the temptations of reductionism by concentrating instead on the many ways in which problems and contingencies present individuals with different opportunities for legitimating their structural interests. These opportunities will be bounded not just by broadly economic or social constraints, but by the available material out of which symbolic representations may be constructed, in short, discourse. Structural interests are thus further distinguished by the different access that they enjoy to discursive resources.

Alford developed the notion of a structural interest in order to analyse health care politics in the United States. There the dominant legitimating discourse of professional medicine served to reinforce the other structural advantages of the "professional monopolists" and effectively repress the interest of community health care. However, the privileged status of the rival discourse of "corporate rationalism" in American society provided a base from which a challenging interest could mount an attack on the dominance of "professional monopoly". In the case of Canadian forestry, Alford's categories are reversed. Here the dominant structural interest is "corporate rationalism". The challenge comes from professional foresters who are seeking to create a quasi-monopoly over certain activities of the kind enjoyed by other, better established professions. We shall argue that, in spite of the favourable conditions created by the crisis in the industry, this challenge has failed. In brief, foresters have been unable to overcome the two major disadvantages from which they suffer. First, the power of the dominant structural interest is such that foresters have been unable to distance themselves from the corporate goal of generating maximum revenue from the resource. Second, the professionals as an interest belong to a number of different groups. Foresters employed by corporations do not share a *group* interest with those employed in government, and neither have the same group interest as these in universities and research institutes. The *structural* interest that they all share in establishing a monopoly for duly accredited 'experts' has generally failed to withstand the cross-pressuring group interests determined by their different locations.

Budworm spraying: the failure of an exclusionary discourse

From the point of view of cultural mediation, the critical move for a challenging interest is to propagate an exclusionary discourse which defines something as a 'problem' in such a way that only the challengers can possibly provide the 'solution'. As a result, the evidence for exclusionary strategies can be found in discourse itself and discourse analysis will be our principal means of investigation. Following the suggestion of John B. Thompson, we have organized our analysis around three features of discourse.[8] First, we look at *narrative*, the ways in which stories can be told to legitimate or delegitimate interests. Second, we consider the *argumentative* structure of discourse concentrating on the way in which the attempt to conceal the propagation of an exclusionary discourse in the act of propagating it generates contradictions and confusions. Finally we consider the contribution of *syntactic* elements, including figures of speech, to the exclusionary project. We have taken a roundabout route to approach the political issue of budworm spraying because we believe that only in the context of the clash of structural interests is any explanation possible.

Since the mid-nineteen seventies, conditions have been favourable not only for the budworm but also for the challenging interest. As the budworm ate their way across eastern Canada, provinces like Nova Scotia, Newfoundland and Ontario whose forest industries were not so seriously threatened as New Brunswick's, began to fear for their wood supply and became embroiled in spraying controversies. In the wake of the budworm came the commissions, committees, task forces and symposia which all serve to legitimate the professional forestry interest and to propagate its exclusionary discourse. They provide fertile ground for further discourse analysis.

Narratives justifying professional monopoly of insect control decisions are common. They tend to be retrospective, interpreting the past in the light of a desirable state of affairs which has been or is just about to be realized. Many of the Royal Commission reports

certain capsule narratives of this kind, but the Canadian Forestry Service obligingly produced an expanded version in the mid-seventies, grandly entitled "(An) historical sketch of the philosophy of spruce budworm control in Canada".[9] The form of their narrative is a familiar one. It is a classical comedy, in which the well meaning but ineffectual attempts at control by previous generations are at length surpassed by entirely new techniques holding out "the promise of new and brighter approaches to the problem." From the security of the not-quite-present we are able to look back on the past with an indulgent if rueful smile.[10]

The authors emphasize the five generations of Canadian researchers who have made contributions to understanding the budworm. We are taken from the "naive optimism" of the DDT days, when it seemed possible that the budworm might be completely eradicated, through the search for less environmentally destructive alternatives and the concomitant change in "philosophy" from eradication to foliage protection, right up to current developments such as bacterial insecticides, viruses, pheromes, growth regulators and improved application technology. Their conclusion that, in spite of all this effort, so little is known about infestation dynamics that "over the past five decades we have attained no viable spruce budworm management strategies," does not transform the comic structure.[11] The tragic tale of human flaws tending inexorably to environmental disaster belongs to the discourse of an altogether different structural interest. For the would-be professional monopolist, the mistakes of the past are the work of malign forces: "our goals have generally been dictated by the budworm, economics and environmentalists and not by forest management".[12] In this revealing conclusion, the enemy is identified as not merely the budworm but also just those structural interests which oppose the pretensions of forest management: the corporate rationalizer with his shortsighted attachment to economics and the environmentalist with his unreasoning hostility to the science of forestry. Once again, the moral of the story is the clear superiority of forest management goals.

In telling their story this way, Fettes and Buckner reveal one of the most damaging contradictions in the professional forester's position, the conflict between scientific and technical motivations. Many of the early researchers to whom they refer were research entomologists who kept their distance from the business of forestry. The clearest statement of this view is to be found in an article on forest pests published along with the annual report on the forest industry in the Canada Year Book for 1939. It contains a very definite statement of scientific neutrality, pointing out that 'pest' is an anthropomorphism and that man is responsible for most of the hazards faced by the forest. It appeared to have enjoyed a certain currency within the profession, for it was republished as a foreword to the entomological report submitted to the Ontario Royal Commission on Forestry in 1946.[13]

However, the transformation of science into technology requires a whole new set of criteria to determine whether the techniques employed are appropriate to the goals sought. As much as managers of all kinds seek to portray themselves as 'experts' concerned only to advise and implement policies whose goals are defined by others, independent professions constantly try to define their own goals. Professional foresters need goals of their own if they are to successfully challenge the corporate rationalizer for control of the forest. However, compared with the clarity and social importance of the drive for maximum profitability, the vague notions of the "good forest" that they have proposed stand little chance of success. The twenty-five years or more that are needed to establish the ideal forest in which equal age classes come to maturity in time to satisfy predetermined

harvesting quotas conflict with the short term goals of corporations seeking to take advantage of market opportunities. In the face of this basic incompatibility the most promising strategy for the professionals has often seemed to be an alliance with the repressed interest strong enough to allow them to mount a serious challenge. But here, as we shall see, the discourse of the professional is ill-adapted to meet the demands of such an alliance. While the goals of forest management remain vague and overshadowed by the goals of corporate rationalism, professional foresters will always remain in the role of challenger.

The contradiction reappears at the level of argument in an issue identified by Gordon Baskerville in his pathbreaking Report on Budworm Spray Alternatives in New Brunswick. He discusses the possibility of educating public opinion to the point where it could be a reliable ally to the challenging interest.[14] In the budworm literature there are persistent references to credibility gaps, "political" decision-making at the behest of uninformed public opinion and the general neglect of scientific criteria. We have explained this phenomenon as the attempt to create an alliance between the challenging and repressed interests strong enough to mount a serious challenge to corporate rationalism. What the argument of all these reports had to conceal was the weakness of this alliance on the spraying issue, where the challengers were actually aligned with the dominant interest against what they both perceived as the dangers of community control.

Both the Nova Scotia Royal Commission on Forestry and the Newfoundland Royal Commission on Forest Protection and Management contain recommendations that the level of public awareness of forestry issues be raised. Given the lack of consensus on what forest management actually is, such recommendations amount to little more than attempts to propagate the exclusionary discourse of the professional interest. In Nova Scotia, the recommendation specified that course units in forestry should be introduced into schools. In addition, the Commission's report returned to one of Baskerville's complaints, recommending that a press officer be hired "to ensure that the media are accurately informed, and questioned in the event of misrepresentation".[15]

The real issue here was stated very bluntly by the Chief Forester of Ontario, speaking at a budworm symposium sponsored by the Canada-Ontario Joint Forestry Research Committee, an organization much admired in both the Nova Scotia and Newfoundland Royal Commission reports. At the symposium, addressing his fellow professionals, Kenneth Armson lamented the fact that "the forestry and scientific professions have been in the main inarticulate in the public arena . . . they have often countered emotion with logic and jargon, and it doesn't work!" As he pointed out, public challenges to the use of pesticides in forest management "essentially" call "into question our professional competence and judgement in managing the public forests".[16]

Exactly what Armson was concerned about here is illustrated by the development of the bacterial insecticide *Bt* and the demand by many communities that, if spraying had to be carried out, *Bt* should be used in preference to the cheaper chemicals. Predictably, industry objected to these demands on the grounds of cost. The reaction of the professionals was more complex. They had a number of concerns with *Bt* , concerns about determining the optimum concentration, about formulating the insecticide so that it would not clog the spray equipment, about the fact that the insects are killed much more slowly with *Bt* and can do more damage, and about the greater susceptibility of *Bt* spraying to adverse weather conditions.[17] In 1976, J.R. Blais, one of the foremost budworm experts in Canada,

reacted angrily to demands by small wood lot owners in Quebec that *Bt* be used in preference to chemicals. As a scientist, he was convinced that *Bt* was not yet ready to go into general operational use and he warned that "situations connected with pollution or protection of the environment readily arouse an emotional response on the part of the public".[18]

The eventual decision of the Quebec government to replace chemical insecticides with *Bt* in 1984 was greeted with similar dismay by foresters in Ontario. Asked at a university symposium on the budworm why Ontario would not follow suit, an entomologist from the Ministry of Natural Resources replied that the decision was "more political than one based on scientific data and facts." Questioned by the local MPP whether he really intended to imply that a political decision was by definition a bad one, this would-be monopolist could only say that he questioned the decision because "(although) they did not necessarily ignore information . . . the information they had led them to the wrong decision"[19] The view that chemical insecticides "have caused no known adverse effect from short-term repeated exposure" has been the official position of the Canadian Forestry Service in its public submissions.[20]

A few farsighted professionals seem to have grasped the real issue here: if forest managers are ever going to be able to enlist public opinion in their fight for control, they will have to stop straining the alliance on the spray issue. Seen from this perspective, the residual doubts about the effectiveness and cost of *Bt* pale into insignificance when set against its public acceptability. Speaking as Assistant Deputy Minister in the New Brunswick Department of Natural Resources, J.R. Carrow, formerly of the Ontario MNR, introduced a seminar on *Bt* by citing Rachel Carson's *Silent Spring*. He was quick to point out that "Carson's allegations were challenged vigorously by the scientific community," but he reminded his audience of the effect of the book on public opinion. Similarly, "while many in the forestry community bemoan the irrational and emotional criticism of forestry use of pesticides, "foresters must face the reality that "for whatever reason" they do not have public support for chemical spraying. With *Bt* as the only operational alternative, the issue is presented as one of retaining control: "we either develop the capacity to protect with more acceptable techniques, or we lose the option to protect significant portions of the forest".[21] Public acceptance of *Bt* came as something of a surprise to many professionals, with their model of the layman as irrational and emotional. One consultant warned against expecting too much from *Bt* research because the public were unlikely to accept "spraying germs".[22] Professionals are beginning to realize that what *Bt* offers is the chance to remain in control of spraying decisions. Set against this substantial achievement, cost-effectiveness is a minor consideration. The recent decision to replace all proposed chemical sprays with *Bt* in Northern Ontario has been widely criticized by the industry, but welcomed by environmental groups.[23]

Technique and rationality

One further example of the development of the exclusionary discourse of the manager is provided in a document sponsored by the Environmental Monitoring Committee in New Brunswick (EMOFICO). In the author's view a clear distinction has to be made between risk assessment, which is a scientific activity, and the proper preserve of experts such as himself, and the subjective judgement of safety which is a political problem.[24] Although it licenses his activities and is hence part of an exclusionary discourse, the distinction cannot

be maintained. While different criteria may be employed in risk assessment and the judgement of safety, it is not true that one set are objective and the other subjective. In particular, the translation of "objective" risk assessments into oral LD50 measurements, usually published with comparable data on deodorants and aspirin, simply fails to address some perfectly "objective" public concerns. These include, first, the general issue of control over a process so that it could be altered or stopped if perceptions changed; second, the related question of the voluntariness of exposure to risk; third, familiarity with the risks in question; fourth, the immediacy of the risk itself; fifth, the ease of reducing the risk by employing other means; and sixth, the degree to which benefits are distributed equitably amongst those who actually bear the risks.[25] It is one thing to say that these are not narrowly scientific questions, but quite another to suggest that they are purely subjective and "emotional" rather than rational.

In actual fact, forest managers have addressed some of these questions. They have tried to explain why, in their judgement, foliage has to be protected with insecticides and, to a lesser extent, they have tried to familiarize the public with the materials used and the methods of application. On the other hand, they have been remarkably insensitive to the problems of voluntariness and control, and they have allowed themselves to be co-opted by the discourse of corporate rationalism on the question of equity. Both cases call into question the ability of the professionals to mount an effective challenge to the dominance of corporate rationalism and jeopardize their chances of alliance with the repressed interest.

On voluntariness and control, the managers have ignored the symbolic dimension of aerial spraying, no doubt seeing it as simply irrational. As a result their accounts constitute a classic public relations disaster, making explicit comparisons between aerial spraying and military operations. In this case, innocence about discourse seriously backfired as commentators allowed themselves to slip from metaphors about battling the budworm to some very concrete and explicit comparisons.[26] It was inevitable that these comparisons would be turned against the proponents of spraying, notably by Elizabeth May in her own account of *Budworm Battles*, which includes the curious observation that the "poisons" being loaded into the bombers were manufactured in Germany and Japan.[27] Here, then, the professionals themselves contributed to the mythic dimension of spray operations, creating the impression that the public are the involuntary victims of an experiment outside their own control.

On the question of whether the risks and benefits are equitably distributed, forest managers have ignored the significance of the fact that pressure for spraying with the cheaper chemicals has come from those who bear the short-term costs and reap the short-term benefits, notably governments and the forest companies. Foresters in both locations have cooperated in presenting the issue as one affecting everybody, typically by citing the value of forest industry products to the local economy.[28] But we need hardly point out that such figures say nothing about equitable distribution. If our argument is correct, the failure of resource managers to address these questions is not an accidental oversight but the result of a structural constraint. While advocates of community control make useful allies against the corporate rationalizers, community control is ultimately an equally dangerous threat to professional forest management. Torn between the ethic of professional neutrality and the destructive demands of industrial forest-exploitation and cross-pressured by their different locations in industry and government, Canadian foresters have fallen some way short of engineering a successful change to corporate dominance of forest policy.

Conclusion

Recent events in the continuing dispute over spraying seem to point to substantial gains by the environmentalist lobby. New Brunswick has been forced to reconsider its spraying policy after more than twenty-five years of continuous application. In Nova Scotia and Newfoundland the anti-spray activists may have suffered defeats, but by taking advantage of the opportunities presented by the commissions and inquiries set up to consider the problem, they have established their right to be heard in the face of the usual attacks on "emotional" and "ill-informed" critics. In Quebec and Ontario, provincial governments have expanded the use of *Bt* to the point where chemicals are only to be applied in exceptional circumstances, at least for the present.

To this extent, then, groups other than forest corporations and the state have been able to carve out a legitimate role in the policy process. But the weakness of the newcomers' position is disguised by the tactical concessions that they have been able to exact. Opponents of corporate control remain divided, and suspicious of each other. The repressed interest lacks a legitimating discourse with any purchase on the prevailing cultural norms of Canadian society. The dominant discourse remains that of corporate rationalisms, operating with great success to define the "crisis" as the problem of wood supply for industry. The challengers have so far failed to develop the notion of forest management as an independent exclusionary discourse and one that has any appeal to the repressed interest as the basis for an alliance. They have been reduced to arguing that forest products corporations are simply too short-sighted to recognize their own interests: forest management loses its status as an exclusionary discourse and becomes merely a better way of running an industrial forest policy. Training mother nature to become a forest management professional is not quite what either community critics or industry has in mind for the forest.

In this sense, the victories won by environmental activists over *Bt* look less significant from the point of view of the repressed interest as a whole. This tactical concession by the more intelligent among the challenging interest leaves community control as far away as ever. The professionals have not discarded the distinction between truly scientific criteria for decision making and "naive", "emotional", "irrational" and "political" ones. They are merely determined to do a better job of selling their criteria than they have in the past. And while they remain subordinate to the dominant interest of corporate rationalism the outcome will be business as usual in Canadian forests.

Notes

1. Canada, Canadian Forestry Service, Forest Management in Canada by F.L.C. Reed and Associates (Ottawa, 1978), vol. 1, p. 29; cf. Jamie Swift, Cut and Run: The Assault on Canada's Forests (Toronto: Between the Lines, 1983); Patricia Marchak, Green Gold: The Forest Industry in B.C. (Vancouver: University of British Columbia Press, 1983).
2. See Forestry Chronicle vol. 51 no. 4 (August 1975), special issue on the spruce budworm; J.R. Blais, "The policy of keeping trees alive via spray operations may hasten the recurrence of spruce budworm outbreaks." Forestry Chronicle 50 (February 1974), pp. 19–21.

3. The Ontario Pesticide Action Committee set up to promote the use of *Bt* was reported to contain representation from Pollution Probe, Environment North, the Central Ontario Tourism Association, the Wildlands League, Temiskaming Environmental Action Committee, the Sierra Club of Ontario and the Preservation of Agricultural Land Association, Globe and Mail, (February 25, 1985), p. 13.
4. Alford, Health Care Politics, pp. 13–14.
5. Christopher Ham and Michael Hill, The Policy Process in the Modern Capitalist State (Brighton, England: Wheatsheaf Books, 1984), pp. 187–189.
6. Robert R. Alford, "Paradigms of relations between State and Society," in L.N. Lindberg, R. Alford, C. Cronch and C. Offe, Stress Contradictions in Modern Capitalism (Lexington, Mass: Lexington Books, 1975), p. 153.
7. Alford, Health Care Politics, p. 18; Alford refers to Murray Edelman, The Symbolic Uses of Politics (Urbana, ILL.: University of Illinois Press, 1964), cf. Edelman, Politics as Symbolic Action (Chicago: Markham, 1971), esp. the section on "symbolic conflict and mass immobilization," pp. 22–4.
8. John B. Thompson, Studies in the Theory of Ideology, (Berkeley and Los Angeles: University of California Press, 1984), pp. 133–9.
9. J.J. Fettes and C.H. Buckner, "Historical sketch of the philosophy of spruce budworm control in Canada," in Proceedings of a symposium on the spruce budworm, Alexandra, Va., November 11–14, 1974 (Washington: United States Department of Agriculture, 1976), p. 59.
10. Frederic Jameson, The Political Unconscious (Ithaca: Cornell University Press, 1981), pp. 103–4.
11. Fettes and Buckner "Historical sketch," p. 58.
12. Fettes and Buckner, p. 60.
13. Canada, Department of Trade and Commerce, Canada Year Book 1939, "Noxious Forest Insects and their Control," by J.J. de Gryse, pp. 257–8; Canada, Department of Agriculture, Forest Entomology in the Province of Ontario, brief submitted by the Forest Insects Investigation Unit to the Ontario Royal Commission on Forestry (Ottawa, 1946), foreword, no pagination.
14. New Brunswick, Department of Natural Resources, Report of the Task Force for Evaluation of Budworm Control Alternatives (Fredericton NB: 1976), pp. 134–8.
15. Nova Scotia, Royal Commission on Forestry, Report (Halifax, 1984), p. 70; Newfoundland and Labrador, Royal Commission on Forest Protection and Management, Report (St. John's, 1981), part 2, p. 110.
16. Kenneth Armson, "Why Are We Here?" in The Spruce Budworm Problem in Ontario–Real or Imaginary? Canada-Ontario Joint Forestry Research Committee, 1983, pp. 4–5.
17. See the summary and references in Baskerville, pp. 94–5; more recent expressions of doubt are recorded in Canada, Environment Canada, Canadian Forestry Service, Review of the Spruce Budworm Outbreak in Newfoundland — Its Control and Management Implications (St. John's, 1981), pp. 117–27; New Brunswick, Department of Natural Resources, B.T. and the Spruce Budworm (Fredericton, 1983), passim.
18. J.R. Blais, "Can Bacillus Thuringiensis Replace Chemical Insecticides in the Control of the Spruce Budworm?" Forestry Chronicle, 52 (1976), p. 60.
19. The Spruce Budworm and our Future Forests, Proceedings of the 17th Annual Lakehead University Forestry Association Symposium, February 1985, panel discussion, no pagination.

20. See e.g., Review of the Spruce Budworm Outbreak in Newfoundland, pp. xxi–xxiii; "The Commission perceives no technical reason, either on the grounds of public safety or functional effectiveness, why bacterial insecticides should be preferred to synthetic chemical insecticides," Nova Scotia Royal Commission on Forestry, Report, p. 37.
21. B.T. and the Spruce Budworm, p. 1; cf. M.A. Roy, "Herbicide Use in Forestry — Towards Building Public Confidence," in The Future of Silviculture in Newfoundland, Proceedings of the Silviculture Newfoundland Symposium, April 5–6, 1983 (St. John's, 1983), pp. 200–13.
22. Frank Webb, special consultant to the New Brunswick DNR, cited in Fred Stevens and William Schabas, "Budworm Fighters Seek New Weapons," Pulp and Paper Canada, 79 (October 1978), p. 28.
23. E.g., I.D. Bird, President of the Ontario Forest Industries Association, "chemical pesticides such as Fenitrothion kills (sic) forest insects on contact. Biological insecticides such as *Bt* can take days to kill budworms. This time span can mean the difference between saving the forest and seeing it destroyed," quoted in The Forest Scene, vol. 17 no. 1 (March 1986), p. 1.
24. Environmental Surveillance in New Brunswick 1978–79: Effects of Spray Operations for Forest Protection, report by EMOFICO (Fredericton: University of New Brunswick, 1980), p. 9.
25. Adapted from Paul Slovic, Baruch Fischoff, and Sarah Lichtenstein, "Facts versus fears: understanding perceived risk," in Daniel Kahneman, Paul Slovic and Amos Tversky (eds.) Judgement Under Uncertainty (Cambridge: Cambridge University Press, 1982), p. 484.
26. For examples of "battling the budworm" see the many titles listed in Daniel T. Jennings et al., Spruce Budworm Bibliography (Orono, Maine: University of Maine, 1979-); for explicit comparisons see, Tom Burrier, "Operation Budworm — Washington," American Forests 69 (September 1963), pp. 28-9; Bruce Young, "Chemical Battle Gives Way to Psychological Warfare;" B.C. Lumberman, 61 (August 1977), p. 28.
27. Elizabeth May, Budworm Battles (Halifax: Four East Publications, 1982), p. 6.
28. Ontario Ministry of Natural Resources, in Answer to Your Concerns About Aerial Spraying in Northern Ontario Forests (Toronto, 1985), no pagination; British Columbia, Ministry of Forests, The Use of Pesticides For Forest and Range Management (Victoria, 1984), no pagination.

UNIVERSITÉ DU QUÉBEC À CHICOUTIMI
555, boulevard de l'Université
Chicoutimi, Québec
G7H 2B1

(418) 545-5011

Université du Québec à Chicoutimi

L'UNIVERSITÉ DU QUÉBEC À CHICOUTIMI

PRÉSENTATION GÉNÉRALE,

Jules Dufour
Doyen des études de 1er cycle

Résumé: L'Université du Québec à Chicoutimi a été fondée en 1969, en même temps que le réseau de l'Université du Québec. C'est un établissement à vocation générale qui offre surtout des programmes d'enseignement de premier et de deuxième cycles. Elle dessert une population d'environ 300 000 habitants répartie dans les régions du Saguenay-Lac St-Jean (Sagamie), de Charlevoix et de la Côte-Nord du Saint-Laurent.

Elle compte en 1985-86 près de 7 000 étudiants(tes), dont 65% sont à temps partiel. Les programmes d'enseignement les plus fréquentés sont ceux des secteurs de l'administration et du génie. Un certain nombre de programmes répondent davantage aux besoins de perfectionnement des clientèles adultes et à temps partiel. Elle compte, pour réaliser sa mission, sur les services de 200 professeurs, 50 professionnels, 200 employés(es) de soutien et un grand nombre de chargés(es) de cours. Son budget annuel de fonctionnement atteint les 30 millions de dollars, somme qu'il convient de tripler lorsque l'on veut estimer ses effets multiplicateurs.

L'UQAC poursuit également un grand nombre de travaux de recherche, soit pour appuyer la programmation d'enseignement, ou pour répondre de façon concrète aux besoins des gouvernements régionaux, des industries, des entreprises commerciales et des organismes communautaires. Mentionnons ici que des projets précis sont menés concernant le Nord, en ingénierie, en études régionales, en éducation amérindienne, en archéologie, en productivité végétale et dans le domaine des ressources minérales. Les subventions obtenues pour mener à bien ces recherches et d'autres ont connu une progression remarquable ces dernières années: de 1 800 000 $ en 1980-81 à 4 000 000 $ en 1985-86. C'est en concertation étroite avec les organismes du milieu que sont conçues et réalisées ces activités de recherche.

Au plan des études avancées, l'UQAC offre des programmes dans lesquels la multidisciplinarité, l'interdisciplinarité et l'intervention sont placées au premier plan. Mentionnons à cet égard la Maîtrise en études régionales, la Maîtrise en ressources et systèmes, la Maîtrise en productivité aquatique, la Maîtrise en gestion des petites et moyennes organisations (PMO) et le Doctorat en ressources minérales.

Avec près de deux décennies d'existence, l'UQAC est appelée à réexaminer en profondeur le rôle et les fonctions spécifiques qu'elle a été amenée à assumer jusqu'à maintenant. Va-t-elle élargir encore davantage sa programmation de premier cycle ou va-t-elle concentrer ses efforts sur certains secteurs liés directement au développement technologique et économique? Va-t-elle intensifier ses activités de recherche ou consolider celles

qu'elle a développées jusqu'à maintenant? Va-t-elle davantage s'associer aux autres établissements universitaires pour porter ses interventions sur des espaces plus vastes et ceci à l'intérieur de programmes de coopération nationale et internationale? Ce sont ces questions fondamentales qui se posent pour l'UQAC, car les processus actuels de désengagement de l'Etat et de privatisation poussent bien des organismes para-publics à s'interroger sérieusement sur les orientations de leur développement.

Abstract: L'Université du Québec à Chicoutimi (l'UQAC) was founded in 1969, in the same year that the general Université du Québec network was established. It is essentially a general arts and science institution focussing on programs for the first and second 'cycles' of the Quebec system. It serves a population of some 300,000 in the regions of Saguenay — Lac St-Jean (Sagamie), Charlevoix and the North Shore of the St. Lawrence.

In 1985–86, the university had close to 7,000 students, 65% enrolled part-time. The largest teaching programs are in administration and technology. Several programs are specifically designed to meet the needs of mature and part-time students. The university has 200 professors, 50 other professionals, 200 staff and a large number of lecturers. The operating budget is in the order of $30 millions which can be tripled by multiplier effects.

L'UQAC also engages in a great deal of research. This is undertaken to support the teaching program, or in response to the needs of regional governments, industries, businesses and community groups. Only research specifically dealing with the North is discussed here. This work is in engineering, regional studies, native studies, archaeology, studies of vegetation productivity, and mineral resources. Research grant support has grown remarkably in recent years, from 1.8 m in 1980–81 to 4.0 m in 1985–86. The university's research activities are carried out in close cooperation with regional groups.

At the graduate level,, l'UQAC stresses programs which are multi- or inter-disciplinary or applied. Examples are the Master's Programs in Regional Studies, Resources and Systems, Aquaculture, and Small and Mid-sized Business Management and the Doctoral Program in Mineral Resources.

After two decades of existence, l'UQAC feels obliged to thoroughly re-examine the particular roles and functions it has assumed. Should it usefully expand its 1st Cycle program or concentrate its efforts on certain sectors with direct technological or economic implications? Should it intensify and diversify its research activities or consolidate those already in existence? Should it develop links with other universities to spread its influence over a wider region including the national and international levels? These are fundamental questions for l'UQAC because the current trend towards government disengagement and privatization puts pressure on para-public institutions to seriously examine the directions in which they are developing.

Lors de la création de l'Université du Québec, le premier ministre du Québec, M. Jean-Jacques Bertrand, déclarait le 9 décembre 1968: «Nous voulons permettre et assurer un tel enracinement des unités constituantes dans leur propre milieu géographique, économique, social et culturel.» De son côté, M. Jean Lesage, chef de l'Opposition, ajoutait: «L'université du Québec sera une université réellement à la disposition du peuple et non pas uniquement à la disposition des classes bourgeoises. Une université qui soit ouverte

aux travailleurs qui veulent accroître leurs connaissances par des cours du soir, ou encore avoir la possibilité de s'inscrire suivant des horaires de cours bien organisés et pouvant s'adapter aux besoins de l'entreprise.»

Comme on peut le constater, l'UQAC est née sous l'égide de l'accessibilité, de l'ouverture, de la rencontre avec un milieu plus vaste, de l'intervention directe, etc. Intervention auprès des PME, des groupes d'intervention socio-économique, des sociétés culturelles, des corps professionnels et des gouvernements régionaux et locaux. Elle a grandi avec cet esprit et est devenue une université profondément enracinée dans son milieu: le sommet économique de 1984 ainsi que les projets qui ont suivi en constituent un témoignage éloquent.

Le plan actuel de développement 1985-88 a été l'occasion pour l'UQAC d'inscrire de façon prioritaire dans ses objectifs l'ouverture à son milieu et à ses préoccupations. Une attention est apportée à la mission sociale et économique de l'université: «L'université est appelée à jouer un rôle de premier plan dans le renouveau de la région et ce, tant par la formation des intervenants nécessaires que comme acteur directement impliqué dans le développement.»

Sa position fondamentale actuelle quant à son rôle social en est une d'identification et d'analyse critique des mutations profondes que subit la société régionale dans le temps et dans l'espace, et de support aux choix possibles.

Le grand défi de l'UQAC est de maintenir à la disposition du milieu l'ensemble de ses ressources. Le «virage» régional entrepris depuis quelques années exige de l'Université le déploiement de ses compétences, car elle représente pour tous les acteurs régionaux une porte ouverte vers l'excellence. L'UQAC apparaît maintenant comme un instrument privilégié du développement régional.

La genèse

Depuis 1969, l'Université du Québec à Chicoutimi a connu deux phases principales de développement. Une première phase, marquée par l'élargissement de la programmation de premier cycle entre 1973 et 1979, a vu doubler la clientèle de 1 800 étudiants(tes) équivalents(tes) à temps plein à 3 600. Une seconde phase, de 1980 à maintenant, s'est caractérisée par une augmentation des étudiants(tes) de l'ordre de 10% par année et par l'implantation d'une dizaine de programmes de deuxième cycle.

L'UQAC a été créée autour d'un noyau initial formé de trois écoles: génie, de formation des maîtres ou normale, et commerce; ces trois entités correspondent à trois départements auxquels se sont ajoutés quatre autres secteurs disciplinaires: les arts et lettres, les sciences humaines, les sciences religieuses et les sciences fondamentales.

Depuis 1974, l'institution a réalisé trois plans de développement qui lui ont permis d'assurer son articulation de plus en plus étroite avec le milieu régional et de développer sa vocation générale.

Le profil actuel

L'UQAC est un établissement à vocation générale qui offre surtout des programmes d'enseignement de premier et de deuxième cycles: elle dispense *78 programmes réguliers* dont 34 baccalauréats, 29 certificats, 12 maîtrises et 2 doctorats. De plus, elle offre présentement une quinzaine de programmes de premier cycle sur mesure. Elle a formé plus de 13 000 personnes (diplômés(es) de premier et de deuxième cycle). Ainsi, avec la clientèle active actuelle, près de 10% de la population a fréquenté l'Université d'une façon ou d'une autre.

Elle dessert une population d'environ *300 000 habitants* répartie sur un territoire de près de 160 000 kilomètres carrés correspondant aux régions du Saguenay-Lac Saint-Jean (Sagamie), de Charlevoix et de la Côte-Nord du Saint-Laurent.

Elle compte en 1985–86 près de *7 000 étudiants(tes)* dont 65% sont à temps partiel. Les programmes d'enseignement les plus fréquentés sont ceux des secteurs de l'administration, du génie et des sciences de l'activité physique. Un certain nombre de programmes répondent davantage aux besoins de perfectionnement des clientèles adultes et à temps partiel. Elle compte, pour réaliser sa mission, sur les services de 201 professeurs(res), 21 cadres, 65 professionnels et 197 employés(es) de soutien et un grand nombre de chargés(es) de cours. Son budget annuel d'opération atteint les *30 millions de dollars*, somme qu'il convient de tripler lorsque l'on veut estimer ses effets multiplicateurs.

L'UQAC poursuit également un grand nombre de travaux de recherche soit pour appuyer la programmation d'enseignement ou pour répondre de façon concrète aux besoins des gouvernements régionaux, des industries, des entreprises commerciales et des organismes communautaires. Mentionnons ici que de nombreux projets précis sont menés concernant le Nord du Québec, en ingénierie de l'environnement atmosphérique, dans le domaine des productions végétales forestières, horticoles et aquatiques, en éducation amérindienne, en archéologie et dans celui des ressources minérales.

Les subventions obtenues pour mener à bien ces recherches et d'autres ont connu une progression remarquable ces dernières années: de 1 800 000 $ en 1980–81 à *4 000 000 $* en 1985–86. C'est en concertation étroite avec les organismes du milieu que sont conçues et réalisées ces activités de recherche.

Au plan des études supérieures ou avancées, l'UQAC offre des programmes dans lesquels la multidisciplinarité, l'interdisciplinarité et l'intervention sont placées au premier plan. Mentionnons à cet égard la Maîtrise en études régionales, la Maîtrise en ressources et systèmes, la Maîtrise en productivité aquatique, la Maîtrise en gestion des petites et moyennes organisations (PMO), la Maîtrise en gestion de projets et le Doctorat en ressources minérales.

Les réalisations d'enseignement et de recherche de l'UQAC ont reçu une reconnaissance officielle, puisqu'en juin 1984, l'Association des Universités et Collèges du Canada accordait à l'UQAC le statut de membre ordinaire de plein droit à l'Association, reconnaissant ainsi l'étendue de ses champs de connaissance et la valeur de ses compétences.

L'UQAC et le Moyen-Nord

Pendant la première phase de son développement, l'UQAC a été appelée l'Université du Moyen-Nord. Elle inscrivait alors l'essentiel de son programme de recherche à l'intérieur d'un centre qui s'appelait le Centre de recherche du Moyen-Nord. Depuis 1980, elle a opté pour la création de groupes de recherche de plus petite taille, et sans doute plus fonctionnels. La dimension médionordique de ses activités reste cependant au coeur de plusieurs projets qui vous seront présentés dans ce livre.

Cette mission nordique de l'UQAC est bien reconnue au Québec. Cependant, avec près de deux décennies d'existence, l'UQAC se trouve un peu déchirée entre le rôle qu'elle doit assumer envers sa région d'intervention immédiate et la mission qu'elle avait voulu développer pour l'ensemble du Nord du Québec. Elle se voit maintenant invitée à réexaminer en profondeur le rôle et les fonctions spécifiques qu'elle a rempli jusqu'à maintenant.

— Va-t-elle élargir encore davantage sa programmation de premier et de deuxième cycles, ou va-t-elle concentrer ses efforts sur certains secteurs liés de façon directe et immédiate au développement technologique?

— Va-t-elle davantage s'associer aux autres établissements universitaires pour porter ses interventions sur des espaces plus vastes et ceci à l'intérieur de programmes de coopération nationale et internationale?

Il n'y a aucun doute que la conférence était une occasion heureuse et un milieu privilégié pour poser ces questions fondamentales. Comment survivre au cours de cette période difficile au cours de laquelle les processus de désengagement de l'État et de privatisation poussent bien des organismes para-publics à s'interroger sérieusement sur les orientations de leur développement?

Les universités périphériques, de petite taille, et dites régionales, ont un rôle primordial à jouer dans le développement des régions pionnières du Moyen-Nord canadien. Ce rôle doit être reconnu et soutenu par les gouvernements. Pour qu'il en soit ainsi, j'estime que des programmes conjoints ou coopératifs, au plan de l'enseignement et de la recherche, entre nos quatre institutions permettraient certainement de créer une force réelle, *un lien médionordique est-ouest* qu'il serait bien difficile d'ignorer dans la définition des orientations du développement nordique au Canada.

L'UNIVERSITÉ ET LE MILIEU RÉGIONAL

Jacques Desbiens
Université du Québec à Chicoutimi

Résumé: Le programme de maîtrise en études régionales de l'Université du Québec à Chicoutimi a pour objectifs de promouvoir la réflexion théorique et la recherche sur les régions, dans une perspective pluridisciplinaire. Plus précisément, le programme permet une réflexion critique sur le concept même de région et ses problèmes de développement, et un approfondissement des connaissances théoriques relatives à l'analyse des sociétés régionales.

Dans cette optique, l'auteur montre toute la pertinence d'un point de vue «régional» dans un contexte nordique. La mise en valeur du Nord est, en effet, synonyme d'exploitation des ressources naturelles de régions isolées et éloignées; c'est aussi synonyme de mal-développement et d'absence de planification inhérents à un modèle de développement régional exogène et extraverti.

Schefferville, avec ses populations blanche et amérindienne constitue un exemple typique. De façon plus particulière, c'est toute la question de la marginalisation des Amérindiens Montagnais et Naskapis de Schefferville, les «laissés-pour-compte» du développement régional du Nord, qui est abordée. Cette recherche s'appuie sur l'étude des impacts du développement nordique sur les populations autochtones, notamment le développement engendré par l'activité minière à Schefferville, et sur la question du devenir des populations amérindiennes de cette région dans la collectivité québécoise. Finalement, l'étude tend à montrer que la communauté amérindienne consitue «une région dans une région».

Abstract: The Master's Program in Regional Studies of l'Université du Québec à Chicoutimi is designed to promote reasoned thought about, and research on, regions, in a multidisciplinary perspective. More precisely, the program allows critical consideration of the concept of regions and problems of regional development and the development of theoretical knowledge relating to the analysis of regional societies.

Within this perspective, the author brings out the relevance of the regional point of view in a northern context. The development of the North is effectively synonymous with the exploitation of resources in isolated and remote regions. It is also synonymous with ineffectual development and with an absence of the planning inherent in models of regional development.

Schefferville, with its Native and white populations, is a typical example. More specifically, it is an example of the marginalization of the Montagnais and Naskapis of Schefferville, the usually-ignored component of regional development of the North, which is addressed. This research focusses on the impacts of northern development on the Native

populations, notably the development generated by mining at Schefferville, and on the future of the native groups of this region within the collectivity of Quebec. Finally, the study shows that the native community forms a 'region within a region'.

Les caractéristiques régionales

La meilleure façon de faire connaissance avec notre région est probablement de la décrire d'abord brièvement par rapport à un critère connu. Comparons donc l'agglomération urbaine Chicoutimi-Jonquière où se situe l'Université du Québec à Chicoutimi (U.Q.A.C.) avec l'agglomération de Sudbury. Nous voyons alors que les deux collectivités sont à peu près semblables en termes de population et de revenus, mais sont différentes en termes de superficie et donc de densité de population, de même qu'en ce qui concerne la langue parlée.

QUELQUES CARACTÉRISTIQUES DES AGGLOMÉRATIONS URBAINES DE RECENSEMENT DE CHICOUTIMI-JONQUIÈRE ET DE SUDBURY EN 1981

	CHICOUTIMI-JONQUIERE	SUDBURY
POPULATION	135 172	149 923
SUPERFICIE (en km^2)	1 133	2 380
DENSITÉ DE LA POPULATION AU km^2	119,4	63,0

LANGUE PARLÉE	CHICOUTIMI-JONQUIÈRE	SUDBURY
Population dont la langue maternelle est le français et qui parle le français à la maison	130 555 (96,6%)	33 745 (22,5%)
Population dont la langue maternelle est l'anglais et qui parle l'anglais à la maison	850 (0,6%)	83 570 (55,7%)
REVENU MOYEN (des ménages privés)	22 960 $	23 764 $

Source: Statistique Canada, 95-948 et 95-974.

Pour mettre en relief les caractéristiques de l'ensemble de la région du Saguenay–Lac Saint-Jean, nous allons mettre en parallèle certaines données sur sa population active avec celles de l'ensemble du Canada, de l'Ontario et du Québec.

COMPARAISON DE LA POPULATION ACTIVE DU CANADA, DE L'ONTARIO, DU QUÉBEC ET DU SAGUENAY–LAC-SAINT-JEAN EN 1985

	CANADA	ONTARIO	QUÉBEC	SLSJ
POPULATION	25 263 000	9 024 000	6 562 000	310 622
POPULATION ACTIVE	12 639 000	4 787 000	3 181 000	132 000
TAUX D'ACTIVITÉ	65,2%	68,0%	62,2%	56,6%
EMPLOIS	11 311 000	4 402 000	2 804 000	112 300
CHÔMEURS	1 328 000	385 000	377 000	19 700
TAUX DE CHÔMAGE	10,5%	8,0%	11,8%	14,9%

Source: Statistique Canada, Enquête sur la population active, 71-001.

On voit immédiatement que la région du Saguenay-Lac-Saint-Jean se caractérise par un faible taux d'activité et un fort taux de chômage.

En 1982–1983, les emplois de la région se répartissaient ainsi:

SECTEUR PRIMAIRE		12,0%
Agriculture	5,0%	
Forêt, chasse et pêche	4,5%	
Mines et carrières	2,4%	
SECTEUR SECONDAIRE		26,6%
Construction	4,5%	
Secteur manufacturier	22,1%	
SECTEUR TERTIAIRE		61,4%
Transports, communications	5,9%	
Commerce, finance et ass.	13,7%	
Services	34,7%	
Administration publique	7,1%	

La région du Saguenay-Lac Saint-Jean est renommée pour son fjord majestueux, le Saguenay, et son célèbre Lac Saint-Jean. Elle attire de nombreux touristes et artistes par la splendeur de ses paysages et l'hospitalité de sa population.

Capitale du Royaume du Saguenay, Chicoutimi est renommée pour son site incomparable. On y trouve à la fois tous les avantages des grandes villes et le calme invitant de la vie en pleine nature, ce qui en fait un lieu de prédilection pour les touristes, les congressistes et les étudiants. C'est dans ce cadre qu'oeuvre l'Université du Québec à Chicoutimi.

La clientèle de L'UQAC

Quoi de mieux, à nouveau, pour décrire notre clientèle, que de la comparer d'abord à celle des autres universités présentes à la Rencontre?

INSCRIPTIONS À TEMPS PLEIN SELON LE NIVEAU, 1983-84

PREMIER CYCLE	UQAC	UQAT	UNIV. LAKEHEAD	UNIV. LAURENTIENNE
Baccalauréats et premiers grades professionnels	1 936	281	2 887	2 953
Diplômes et certificats	318	77	—	49
Autres	20	13	523	10
Sous-total	2 274	371	3 410	3 012
SECOND ET TROISIÈME CYCLES				
Maîtrises	114	19	113	78
Doctorats	—	—	—	—
Diplômes et certificats	—	—	16	—
Autres	—	—	—	10
Sous-total	114	19	129	88
TOTAL	2 388	390	3 539	3 100

Source: Statistique Canada, 81-204 annuel, 1983.

En fait, à l'automne 1985, l'Université du Québec à Chicoutimi comptait 7 046 étudiants qui suivaient des cours à Chicoutimi même, ainsi que dans des centres hors-campus. De ce nombre, 2 576 étaient des étudiants à temps plein et 4 470 étudiaient à temps partiel. Au total, pour l'année 1985-86, la population étudiante en équivalents d'étudiants à temps complet s'est élevée à 4 183.

Les ressources de L'UQAC

Pour satisfaire les besoins de sa clientèle, l'UQAC dispose de ressources diverses. Du côté des ressources matérielles d'abord, notre université est bien pourvue. En effet, depuis septembre 1982, l'UQAC donne tout son enseignement sur son campus, dans de nouveaux locaux construits en prolongement d'un premier pavillon que l'Université occupe depuis 1974. Le pavillon de la rue Jacques-Cartier continue à loger l'administration et quelques autres services. Peu après la tenue des Jeux du Canada de 1983, la Société des Jeux a remis à l'Université le pavillon sportif construit pour cette occasion sur le site même du campus universitaire. L'Université est aussi pourvue de toutes les installations et activités socio-culturelles et sportives que recherche l'étudiant soucieux de son développement complet.

L'Université du Québec à Chicoutimi dispose également de ressources humaines variées et qualifiées. On y retrouve actuellement 201 professeurs, 21 cadres, 65 professionnels et 197 employés de soutien, pour un grand total de 484 personnes qui oeuvrent à temps complet à l'Université. En outre, 930 charges de cours ont été dispensées en appoint durant l'année 1985–86. De plus, durant cette période, 252 personnes sont intervenues, à un titre ou à un autre, comme employés professionnels à temps partiel, soit l'équivalent de 35 travailleurs supplémentaires à temps complet. Enfin, 576 personnes différentes sont aussi intervenues, dans des rôles divers comme employés de soutien à temps partiel, soit l'équivalent de 68 travailleurs à temps complet. En fait, à chaque période de paie, l'Université remet en moyenne 800 chèques de paie à ses employés. L'Université puise donc dans un vaste réservoir de ressources humaines compétentes et dévouées.

De plus, ces emplois représentent un apport économique important pour la région. En effet, les ressources financières dont dispose l'Université s'élèvent en 1986–87 à 30 millions de dollars pour le budget de fonctionnement et à 3 millions de dollars pour la recherche. De ces montants, 72%, soit près de 24 millions de dollars, sont consacrés aux traitements.

La participation à l'activité

Implantée au coeur d'une vaste région, L'Université du Québec à Chicoutimi est fortement engagée dans son milieu et soucieuse de servir la collectivité régionale. C'est pourquoi ses programmes d'études sont offerts non seulement à Chicoutimi, mais également dans des centres hors-campus à Alma, à Saint-Félicien, à La Malbaie et sur la Côte-Nord où elle donne de l'enseignement à Sept-Îles et dans plusieurs localités du Nouveau-Québec.

En 1985, l'Université a ainsi offert 148 cours dans ses centres hors-campus. Ces cours ont touché 3 873 étudiants-cours soit une moyenne de 26,2 étudiants par cours.

En plus de servir la population régionale partout où elle se trouve, l'Université du Québec à Chicoutimi s'est fortement engagée dans son milieu. Cela s'est fait tout autant par la présence constante de ses diverses ressources humaines dans les services à la collectivité que par une participation directe de ses représentants officiels dans plusieurs activités importantes pour la région.

Ainsi, au Sommet sur le développement et l'économie régionale qui s'est tenu en mai 1984, l'Université a été associée à plus du quart des résolutions adoptées. En novembre 1984,

l'Université était encore partenaire dans la création de LOGEQ (Laboratoire d'outils de gestion étudiant du Québec) lequel vise, par des stages universitaires et pratiques, à faciliter l'intégration des jeunes au marché du travail. Dans sa première année de fonctionnement, cet organisme a contribué à la création de 8 entreprises et permis à 120 personnes de faire des stages de 10 à 20 semaines dans des milieux de travail divers. Enfin, le 2 juin dernier, l'Université du Québec à Chicoutimi était fière de participer au lancement de SOCCRENT (Société en commandite de création d'entreprises). Cet organisme, qui dispose au départ d'un capital-actions de 10 millions de dollars, est voué à la création de nouvelles entreprises et à l'expansion d'entreprises existantes. Il a été mis sur pied, grâce à une participation quotidienne à l'élaboration de son concept, par des gens de l'Université et d'ALCAN, et il compte parmi ses partenaires: Alcan, Abitibi-Price, Consolidated Bathurst, Papiers Cascades, Gaz Métropolitain, le Mouvement Desjardins et des gens d'affaires de la région, regroupés dans une société régionale d'investissement.

En somme, comme nous venons de le voir, l'Université du Québec à Chicoutimi est une organisation largement engagée dans les activités de son milieu régional et qui vise à bien servir la communauté à laquelle elle appartient.

LES ÉTUDES AMÉRINDIENNES

Jacques Kurtness
Université du Québec à Chicoutimi

Résumé: L'auteur s'efforce de mettre en évidence les différentes options offertes à la population autochtone en matière d'éducation post-secondaire. Après avoir cerné le problème, il présente des données de telle manière que les intéressés peuvent choisir l'option ou les options qui conviennent à leurs besoins ou aux circonstances. L'auteur conclut son exposé en décrivant les conséquences de ces différents choix et les paradoxes qu'ils évoquent.

Abstract: The author outlines the different post secondary options available for Native students. Having outlined the topic, he presents information on ways in which interested persons can choose the option or options which best suit their needs or circumstances. The account concludes with a description of the consequences of the various choices and of the paradoxes which they evoke.

1. Description du problème

A. Bref historique

L'analyse des communications présentées en 1969, lors de la «Conférence transculturelle du Nord» organisée à Montréal par l'Institut arctique de l'Amérique du Nord, montre que le Canada et le Québec ne sont pas les seuls à rechercher des solutions aux problèmes de l'enseignement dans une nation multiculturelle. Plusieurs autres pays font face aux

mêmes difficultés. Certains les ont surmontées à la satisfaction des minorités ethniques, mais d'autres cherchent encore; d'autres les ont «résolues» en diluant les différents groupes ethniques dans un réseau d'enseignement national ou dans un appareil scolaire importé.

Pour certains pays, les modèles scolaires français ou britanniques, de même que leur contenu, on été adoptés presque dans leur forme originelle (cf. «Nos ancêtres les Gaulois»). Même la collation des grades et la certification demeurent l'apanage de la nation colonisatrice (comme aux îles Fidji). A l'autre extrême, on a développé des modèles scolaires innovateurs en les fondant sur les valeurs et les buts des groupes ethniques traditionnels, avec suffisamment de contenu nouveau pour permettre une participation et une contribution à la vie nationale (par ex. en Suède).

Entre ces deux extrêmes, certains pays font la promotion de leur appareil scolaire national en l'assortissant de certaines variations pour tenir compte de la diversité culturelle locale (par ex. en U.R.S.S.).

Dans tous les cas, les efforts sont fonction des ressources disponibles: corps enseignant plus ou moins nombreux, diversité des groupes ethniques et ampleur de la richesse nationale, à partir de sources internes ou grâce à l'aide extérieure. Ils dépendent aussi largement du degré de tolérance culturelle de la population dominante et de la volonté du groupe ethnique minoritaire désireux de maintenir ses caractéristiques culturelles.

Dans tous les cas également, on observe l'existence de dénominateurs communs dans l'éducation des groupes minoritaires et autochtones. Les premières activités éducatives sont invariablement liées aux initiatives des missionnaires, ou encore à la propagande politique (dans le cas des pays communistes ou socialistes). Dans un but manifeste d'évangélisation religieuse ou de persuasion politique, les «missionnaires» se sont fait un devoir d'apprendre les langues autochtones et d'enseigner les rudiments de leur écriture. Évidemment, cette contribution est loin d'être négligeable et, dans certains cas, elle demeure le seul bien culturel disponible.

B. Situation contemporaine

Dans un deuxième temps, une législation vient habituellement dénouer la collusion «césaro-papiste» et les liens de l'Église avec l'enseignement. C'est ainsi que plusieurs établissements d'enseignement supérieur ont été créés par des congrégations religieuses (mentionnons, entre autres, Harvard et Yale aux E.U.; Laval et le Collège des Ursulines au Québec).

De façon encore plus proche de nous, on note de l'intérêt pour l'éducation universitaire (par ex.: Universités Trent et Carleton en Ontario, Sine en Saskatchewan, «Natives Studies» ailleurs au Canada et «Etudes amérindiennes» à Chicoutimi). La plupart des programmes de ces établissements sont bien intentionnés. On fait un effort pour sensibiliser les non-Indiens à l'existence des cultures amérindiennes (en estimant que la connaissance réduirait les préjugés). De même s'efforce-t-on de fournir aux étudiants autochtones des options éducatives viables (allant de l'établissement non-indien aux critères d'entrée libéraux et souples ou à l'établissement entièrement ou partiellement indien, chargé spécialement de transmettre la culture amérindienne).

Voilà des efforts louables et honorables. Cependant, on observe certains petits problèmes en analysant les points d'intersection des différentes variables mentionnées. Faisons deux distinctions: premièrement entre «le contenu des cours universitaires» (par ex.: certains cours d'anthropologie qui traitent des Indiens habituellement «chasseurs-cueilleurs-trappeurs» et les «cours spéciaux à contenu indien» (ou les institutions indiennes ou partiellement indiennes); deuxièmement entre les étudiants non-indiens et les étudiants indiens. Si l'on fait ces deux distinctions, on peut définir les variables majeures actuelles de la formation universitaire des Autochtones.

2. Options potentielles pour une formation universitaire

COURS OU CONTENU INSTITUTIONNEL		
Origine culturelle de l'étudiant	Université normale (contenu des cours)	Cours spéciaux aux Indiens ou établissements
non-indien	1	2
indien	3	4

Voici maintenant la description des diverses options.

A. Option 1

C'est la fonction habituelle accomplie quotidiennement par les universités et les collèges canadiens et québécois. Il s'agit essentiellement d'établissements non-indiens offrant des services à une population non-indienne. Ils suivent habituellement de fortes traditions (sauf UQ), enracinées dans l'histoire intellectuelle européenne. Depuis plusieurs siècles (par ex.: U. Laval), malgré la crise actuelle des universités, celles-ci ont relativement bien servi la collectivité environnante.

B. Option 2

Quelques programmes innovateurs (par ex.: U. Trent) visent en partie à mieux faire comprendre les cultures et les sociétés autochtones, dans le but implicite de réduire les préjugés (et opinions fausses) et d'augmenter l'acceptation interculturelle. Certains (ex.: Sine, l'amérindianisation) ont suivi cette voie, particulièrement pour les professeurs et les étudiants-maîtres.

C. Option 3

D'autres programmes visent à encourager les Indiens à s'inscrire dans les établissements normaux (par ex.: AINC, Université de Toronto). Certains ont assoupli leurs conditions d'admission (par ex.: UQ et les 22 et plus) et cette initiative s'inspire de l'ouverture des

universités américaines aux étudiants noirs. En outre, d'autres programmes (par ex.: «Remedial Education Program» de l'A.I.N.C., d'Emploi, Main d'oeuvre et Immigration, des collèges communautaires) s'efforcent d'accroître la participation indienne en haussant la formation des futurs étudiants jusqu'au niveau d'entrée universitaire.

D. Option 4

Finalement, d'autres programmes (par ex.: U. Trent et U.B.C.) ont formé une section amérindienne au sein de l'université. D'autres établissements sont uniquement indiens (Nishnawbe, North American Indian Traveling College, Deganawidah-Quetzacoatl University, Navaho Community College, Southwestern Indian Polytechnical Institute). Voilà pour le niveau collégial et universitaire; au niveau secondaire, mentionnons le Teaching and Research in Bicultural Education (TRIBE) au Nouveau-Brunswick et au Maine, et le Rough Rock Demonstration School, en Arizona. Ces établissements font appel à des professeurs autochtones et s'adressent aux étudiants autochtones, bien que certains enseignent aussi les non-Indiens (par ex.: U. Trent, Navaho Community College), qui fonctionnent en fait selon le modèle 2. Leur objectif essentiel est de transmettre la culture autochtone et d'évaluer (de façon critique) l'influence de la culture non-indienne sur la vie indienne.

3. Implications

Certes, les deux options (favoriser la compréhension inter-culturelle aux étudiants non-indiens, et fournir une éducation indienne aux étudiants indiens) ne sont pas incompatibles, ni mutuellement exclusives. Ainsi, Trent University semble réussir en fonctionnant selon les modèles 2 et 4. Cependant, comme ce genre de programme nécessite un nombre suffisant d'enseignants autochtones hautement qualifiés, la mise en oeuvre rapide de programmes de ces deux modèles épuise les ressources humaines disponibles. Le principe de réalité est important dans ce cas, car les deux options nécessitent une adaptation interne et externe, du côté de l'établissement comme du côté des organismes autochtones.

En ce qui concerne l'option 3 (modèle libéral des universités), son expansion demande à être analysée sérieusement car, contrairement à l'attitude des Noirs aux E.U., celle des nations autochtones du Canada et du Québec vise à maintenir leur droit de non-participation aux institutions non-indiennes (par ex.: réaction ou plutôt non-réaction au Plan triennal des Études amérindiennes, 80-83).

Ainsi devient-il de plus en plus clair que le seul guide dans le choix des différents modèles (2 et 4, ou 3) est ce que les nations autochtones et le peuple autochtone veulent avoir. Il est impératif que les Indiens et les non-Indiens s'entendent sur cette question rapidement avant de créer un appareil universitaire (modèle 3) qui resterait inutilisé ou sous-utilisé.

Plusieurs options sont donc possibles. La réaction de certains non-Indiens, notant le faible nombre d'Indiens inscrits dans les établissements d'enseignement post-secondaire est de réduire les normes d'admission pour les y attirer, pensant ainsi remédier à l'injustice perçue. Cependant cette stratégie, en rendant l'éducation post-secondaire tellement attrayante, réduit la validité des choix 2 et 4 pour les Autochtones. Cette décision unilatérale est aussi mauvaise pour les Indiens que celle des universités traditionnelles et exclusives.

Université du Québec à Chicoutimi

L'Université peut être attrayante, même pour la société indienne (richesse, prestige, pouvoir), mais elle peut aussi être adverse en raison des contraintes psychologiques, sociales et culturelles imposées à l'étudiant indien. Il semble injuste d'obliger la jeunesse indienne à les accepter, et c'est également superflu, car le modèle 4 peut transmettre suffisamment de contenu québécois (ou euro-canadien) pour permettre la concurrence entre diplômés.

RELATIONS INTER-ETHNIQUES ET DYNAMIQUE DE DÉVELOPPEMENT EN MILIEU NORDIQUE

Michel Barbeau
Université du Québec à Chicoutimi

Résumé: Le programme de maîtrise en études régionales de l'Université du Québec à Chicoutimi a pour objectifs de promouvoir la réflexion théorique et la recherche sur les régions, dans une perspective multidisciplinaire. Plus précisément, le programme permet une réflexion critique sur le concept même de région et ses problèmes de développement, et un approfondissement des connaissances théoriques pertinentes à l'analyse des sociétés régionales.

Dans cette optique, cette communication, qui présente les grandes lignes d'un mémoire portant sur «Les relations inter-ethniques et la dynamique de développement en milieu nordique», démontre toute la pertinence de la réflexion «régionale» dans un contexte nordique. La mise en valeur du Nord est, en effet, synonyme d'exploitation des ressources naturelles de régions isolées et éloignées; c'est aussi synonyme de mal-développement et d'absence de planification inhérents à un modèle de développement régional exogène et extraverti.

Schefferville, avec ses populations blanche et amérindienne constitue un exemple typique. De façon plus particulière, c'est toute la question de la marginalisation des amérindiens Montagnais et Naskapis de Schefferville, les «laissés-pour-compte» du développement régional du Nord qui est abordée. Cette recherche s'appuie sur l'étude des impacts du développement nordique sur les populations autochtones, notamment le développement amené par l'activité minière à Schefferville et sur la question du devenir des populations amérindiennes de cette région dans le collectif québécois. En finalité, l'étude tend à démontrer que la collectivité amérindienne constitue «une région dans une région».

Abstract: The M.A. program in regional studies at the University of Quebec at Chicoutimi is intended to stimulate theoretical study and research on the subject of regions in a multidisciplinary perspective. More exactly, the program provides the opportunity for critical thinking about the regional concept itself and the problems of regional development, and for a more thorough examination of theories relevant to the analysis of regional societies.

Within this framework the paper, which presents the general summary and preliminary conclusions of a thesis on "Inter-ethnic relations and the dynamics of development in a northern environment", shows how relevant the "regional" approach is in a northern context. Northern development is in fact synonymous with the extraction of natural resources in remote, isolated regions; it is also synonymous with inadequate development and absence of planning, inherent in an exogenous and externally oriented model of regional development.

Schefferville, with its white and Amerindian populations, is a typical example. The study lays particular emphasis on a comparison of the perceptions which the white and Amerindian groups in Schefferville have of the attitudes of Amerindians to the majority society. The attitudes are measured in terms of collective identification along the three dimensions of *assimilation* (merging with the majority society, with loss of ethnic identity), *integration* (or selective incorporation of cultural elements from the majority society, accompanied by maintenance of identity with the traditional reference group and preservation of values) and *rejection* (either through abandonment of links with the majority society or reaffirmation of identification with the traditional reference group) Kurtness 1983. Preliminary results show that there are two ethnic groups with contradictory perceptions.

This research, centred on the problem of Amerindian marginalization, tends towards the conclusion that the Amerindian community of Schefferville constitutes "a region within a region".

La mise en valeur du Nord c'est aussi, à fortiori, celle de l'hinterland de la Côte-Nord et de ses richesses naturelles. L'aventure minière des récentes décennies, en particulier celle de la société Iron Ore du Canada (IOC) à Schefferville, a montré avec force les conséquences du mal-développement et de l'absence de planification. La désertion du territoire par cette entreprise minière en novembre 1983 marque un tournant dans l'histoire régionale de la Côte-Nord: Schefferville, (fig. 1, 2) ville nordique mono-industrielle typique du Nord, est devenue à son tour, tout comme Gagnon, victime de l'«impermanence» caractéristique des pôles d'exploitation pionniers (Hamelin, 1975) et du fameux mythe du Nord, cette Terre promise (Morrissonneau, 1978). Ayant existé par et pour l'exploitation du fer, Schefferville disparaît avec sa raison d'être.

Pour les Amérindiens Montagnais et Naskapis, exclus en grande partie du développement minier, le départ de l'Iron Ore marque une rupture dans le processus historique d'un développement caractérisé par une mise en valeur des ressources du territoire au profit des Blancs, notamment ceux du Sud. Un survol des activités qui ont marqué l'histoire de la Côte-Nord, de la traite des fourrures à l'extraction des minerais stratégiques, en passant par l'épopée récente de l'hydroélectricité, permet de constater que le modèle qui prévaut dans la mise en valeur de cette région, comme de celui du Nord en général, est un modèle exogène, extraverti. On serait tenté de conclure qu'avec la disparition de la ville de Schefferville, le retour du territoire aux premiers occupants semble un juste retour des choses.

En utilisant comme toile de fond la situation qui a prévalu à Schefferville dans la période suivant immédiatement la cessation définitive des activités de la société minière Iron Ore, nous envisageons plus particulièrement les aspects des relations inter-ethniques; et c'est

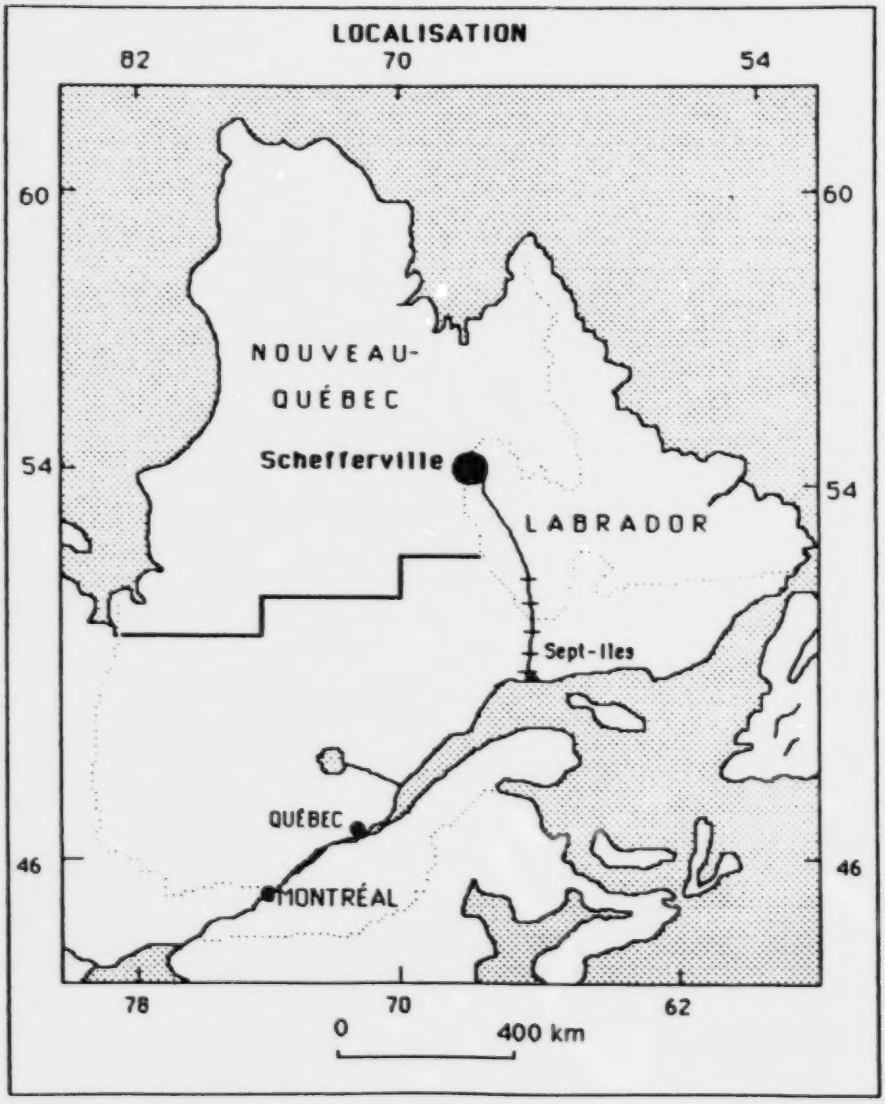
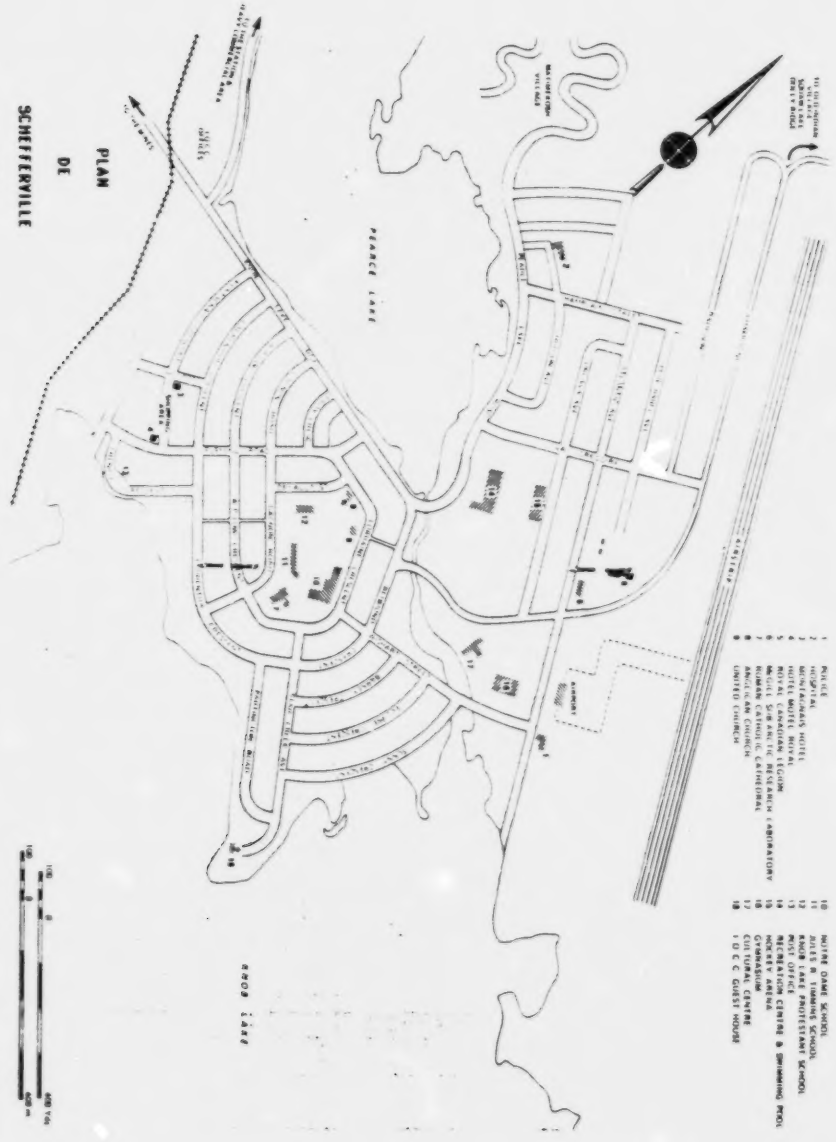

LOCALISATION
82
70
54
60
60
NOUVEAU-
QUÉBEC
54
Schefferville
54
LABRADOR
Sept-Iles
QUÉBEC
46
MONTRÉAL
46
78
70
62
0
400 km

Figure 1



Source McGill Sub-Arctic Research Paper No 27, 1975

Figure 2

non pas tant en termes stricts de relations entre deux groupes ethniques partageant le même territoire qu'en termes de bilan d'échange entre deux cultures différentes, échanges caractérisant, entre autres, la dynamique de développement en milieu nordique. Notre démarche s'appuie sur le postulat suivant: dans le processus historique de développement imposé par des gens d'une culture différente, le type de développement choisi par l'Iron Ore a exclu les Amérindiens du développement économique et a contribué à leur marginalisation.

Les populations autochtones, adaptées au territoire depuis des millénaires, ont vu en effet leur mode de vie bouleversé depuis les premiers contacts avec les Blancs, voici officiellement plus de 450 ans. La déstructuration de leur mode de vie, leur acculturation et la dépendance qui en résultent ont rendu difficile la participation pleine et entière des Amérindiens à la société québécoise et canadienne. De fait, parce qu'ignorés des processus de développement, les Amérindiens ont subi plus que choisi le rôle et la place qu'ils occupent dans la société. Les relations inter-ethniques entre Blancs et Indiens, caractérisées par l'incompréhension du monde amérindien, ont facilité le clivage entre les deux ethnies. Ce clivage, en plus de nuire à un véritable dialogue inter-ethnique, a influé sur la dynamique de développement en niant implicitement la contribution de l'Amérindien au devenir de la société.

Le développement régional se définit comme un progrès cohérent et harmonisé sur le plan technique et humain; il implique une utilisation optimale de l'espace et la mise en valeur rationnelle des ressources naturelles en vue d'un développement économique harmonieux et de l'épanouissement des *populations* (Lajugie et coll., 1979). Toutefois, dans la vaste question de mise en valeur du Québec nordique, force est de constater que les Autochtones, minoritaires et dépendants, ont été laissés pour compte.

C'est précisément dans ce contexte que s'inscrit la situation des Montagnais et des Naskapis de Schefferville. Ceux-ci n'ont profité directement des activités de l'Iron Ore (voir le tableau I) qu'en tant que main-d'oeuvre disponible sur place pour la construction de la ville et du chemin de fer. Ils ont vécu en marge de l'activité minière, en bénéficiant toutefois de la proximité d'une agglomération leur offrant des services essentiels ou utiles (magasins, hôpital, etc.)

TABLEAU I MAIN D'OEUVRE AUTOCHTONE PAR RAPPORT À LA MAIN D'OEUVRE TOTALE EMPLOYÉE PAR L'IRON ORE À SCHEFFERVILLE.

	1950–1955	Décennies 1960–1970	1980	2 nov. 1982
Montagnais	} 10	25–26[2]	25–26[3]	6[4]
Naskapis		20[2]	20[3]	n d
Blancs	6900*	1223	305	161
Total	6900[1]	1268	350	167[5]

*Approximation

Sources:

1. GRÉGOIRE 1976.
2. MRC DE CAINAPISCAU 1985. La littérature mentionne qu'à l'époque environ 1000 employés de l'IOC oeuvraient à Schefferville. DÉSY rapporte qu'en 1962 «on a atteint (pour les Amérindiens) le chiffre maximum de 80 employés au mois de juillet (. . .), dès août on commençait à débaucher (sic); dès septembre, il ne restait plus que 30 Indiens; on prévoyait en garder une vingtaine pour l'hiver: des Montagnais en majeure partie» (DÉSY, 1963:64).
3. WOLFE, 1983.
4. Après la mise à pied de l'automne 1981 (VAKIL, 1983).
5. IOC, 1983.

Depuis leur installation au lac John et, plus tard, dans la réserve de Matimekosh, attenante à Schefferville (voir la carte), les Amérindiens ont donc subi les règles du jeu, contraintes administratives, économiques et politiques, étrangères à leur mode d'existence. Cependant, deux événements viendront modifier la situation. Le premier concerne l'émergence, chez les Amérindiens, de l'idée d'autonomie politique garante du maintien des droits ancestraux. Ce mouvement se traduit, entre autres, par une volonté réelle de participer à l'amélioration de leur condition sociale et politique et de contribuer, comme citoyens à part entière, à la société québécoise et canadienne. Le second événement, d'ordre économique, concerne la cessation des activités de la société minière Iron Ore. L'exode massif de la population blanche qui s'ensuivit eut pour effet de renverser une situation qui place dorénavant les Allochtones de Schefferville en minorité: la balance numérique est en faveur des Amérindiens dont la population est environ quatre fois plus élevée que celle des Blancs (voir les figures 3 et 4).

Figure 3

Proportion des populations allochtone et autochtone de Schefferville 1981 et 1984

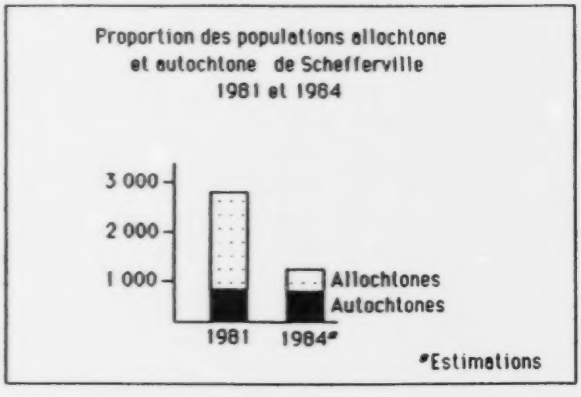
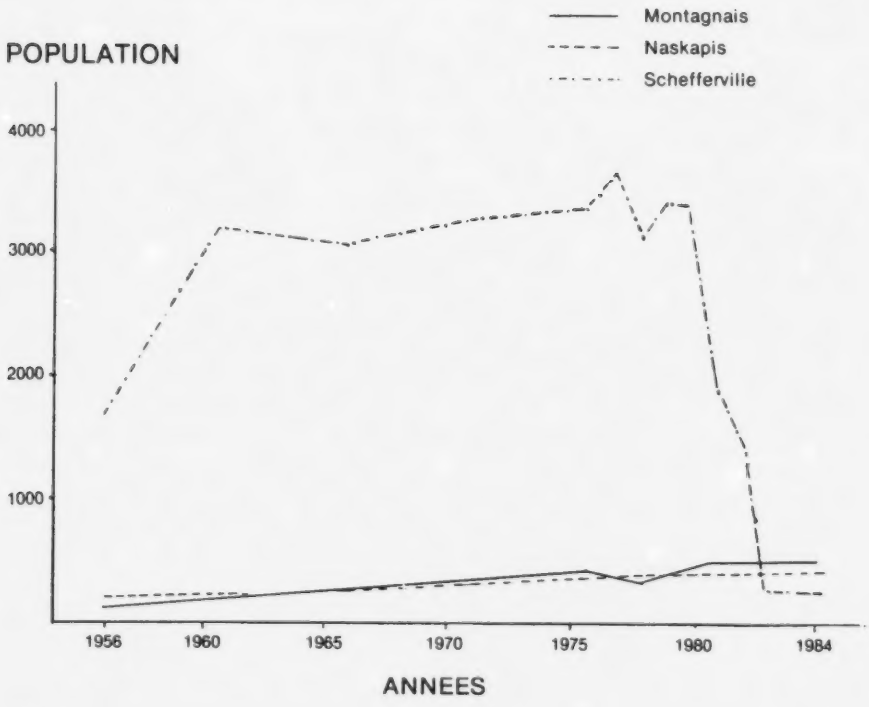


Figure 4

Évolution des populations allochtone et autochtone de Schefferville 1956-1984



Source: Tiré du tableau «Évolution de la population des communautés du Québec-Labrador» MRC de Caniapiscau (1985), p. 15.

C'est également toute la problématique de la planification du changement qui sous-tend l'étude. L'intégration culturelle, c'est-à-dire l'assimilation, par les Autochtones, du mode de vie des Blancs, a résulté en une déstructuration de l'existence amérindienne éloignant, les Autochtones tant du mode de vie traditionnel que du mode de vie des Blancs. L'Indien n'est plus tout à fait Indien, ni encore tout à fait Blanc. Le défi est donc de retrouver l'équilibre d'un mode de vie qui, tout en considérant la réalité actuelle, permettrait à l'Amérindien d'assumer pleinement son identité et, par rapport à la société majoritaire, d'éviter la relation dominant-dominé où il tient le plus souvent le mauvais rôle.

En premier lieu, nous visons à saisir la dynamique de développement en milieu nordique à travers les relations entre deux communautés (autochtone et allochtone) partageant le même territoire (Schefferville), mais de modes de vie différents et vivant un renversement de situation probablement unique au Québec, qui place les Autochtones en situation majoritaire.

Cette analyse permettra l'étude des processus menant 1) à la déstructuration du mode de vie amérindien et au développement d'une relation de dépendance de l'Amérindien envers le Blanc; 2) à la faillite du processus d'intégration d'une société minoritaire à une société majoritaire; 3) à la réaffirmation culturelle susceptible d'assurer aux Amérindiens une contribution équitable à la société.

Dans notre démarche à la fois normative et historique, nous nous appuyons sur la problématique de la marginalité et de l'acculturation des communautés amérindiennes du Québec, notamment montagnaise, problématique abordée par des auteurs tels que Désy (1963), Charest (1977, 1982) et Kurtness (1983). Notre recherche se fonde également sur les problématiques de croissance et de déclin des isolats nordiques (Muller-Wille, 1983; Bradbury & Wolfe, 1983), des impacts de cette dynamique sur les populations autochtones (entre autres Grégoire, 1976), ainsi que du devenir des populations amérindiennes dans le collectif québécois (Conseil Attikamek-Montagnais). Il ne s'agit ici que de quelques lectures qui ont inspiré notre réflexion et ne sauraient, bien entendu, représenter exhaustivement toute la littérature portant sur l'un ou l'autre des aspects mentionnés.

Un des aspects originaux de cette étude est de mettre à contribution les résultats d'une enquête effectuée à l'été de 1984, et qui visait à déterminer, entre autres, les valeurs psychoculturelles réciproques des communautés blanche et montagnaise de Schefferville (Laforge, Kurtness, Radouco-Thomas, 1984).

Mentionnons, en terminant, que le plan global de notre mémoire comporte trois parties consacrées:

1. au déclin de Schefferville ou à l'expérience vécue du mal-développement nordique. Ce volet fait état de l'exploitation minière comme élément d'un développement exogène et extraverti. Il dresse également un portrait des deux communautés, c'est à dire du milieu blanc et du milieu amérindien;
2. à la marginalisation des Amérindiens. Ce volet aborde les divers aspects de la déstructuration du mode de vie amérindien et de l'établissement de relations asymétriques et de dépendance envers les Blancs. Il vise à identifier les origines des comportements et du mode de vie amérindiens à Schefferville;
3. à la dynamique des relations inter-ethniques basée sur les facteurs de divergence et les intérêts des groupes ethniques en présence (Blancs face aux Amérindiens).

Il serait prématuré de publier maintenant les résultats définitifs de l'analyse du questionnaire sur les valeurs psycho-culturelles des communautés blanche et montagnaise. Cependant, une analyse préliminaire montre l'émergence de deux groupes distincts au sein de la population autochtone montagnaise.

Cette polarisation répond, d'une part, à un mouvement vers la société québécoise (surtout des jeunes, fort nombreux) et, d'autre part, à un retour vers la culture traditionnelle (des plus âgés, habitués à l'ancien mode de vie).

Finalement, l'étude montrera que, dans le vaste problème du développement nordique, les collectivités amérindiennes constituent une «région dans une région».

Bibliographie (Quelques titres pertinents)

Andre, Mathieu. Moi «Mestenapeu», Traduction Montagnaise, Éditions Ino. 1984.

Barbeau, Michel. La réappropriation du territoire à Schefferville: utopie ou réalité? Le Sagamien, vol. 5, nº 9. Les laboratoires de géographie, Université du Québec à Chicoutimi, 1985.

Bradbury, John, Wolfe, Jeanne M. (dir. de publ.) Recession, Planning and Socio-Economic Change in the Quebec-Labrador Iron-Mining Region. MSARP nº 38, Centre for Northern Studies and Research, McGill University, 1983.

Charest, Paul. Les impacts de l'exploitation forestière sur le milieu physique, les activités cynégétiques et les droits territoriaux des Montagnais de la moyenne et basse Côte-Nord. Rapport de recherche présenté au Conseil Attikamek-Montagnais. Avril 1977.

Charest, Paul. Les ressources naturelles de la Côte-Nord ou la richesse des autres: une analyse diachronique. Recherches Amérindiennes au Québec. Vol. 5, nº 2, 35–52.

Charest, Paul. Recherches anthropologiques et contexte politique en milieu attikamek et montagnais. Culture. Vol. II, nº 3, 1982, 11–23.

Conseil de la MRC de Caniapiscau. MRC de Caniapiscau. Elément d'une gestion harmonieuse. Document de consultation. Conseil de la MRC de Caniapiscau. Fermont, novembre 1985.

Désy, Pierrette. Acculturation et socio-économie chez les Montagnais et les Naskapis du lac John près de Schefferville. M.A. géographie, Université Laval, Québec. Septembre 1963.

Gauthier, Pauline. Recherche sur la qualité de la vie à Schefferville. Rapport présenté au Comité de reclassement des employeurs et Association des travailleurs de Schefferville. CLSC. Fermont. Décembre 1983.

Grégoire, Pierre. Impact du développement minier sur la population montagnaise de Schefferville. Conseil Attikamek-Montagnais, Village des Hurons, 1976.

Hamelin, Louis-Edmond. Nordicité canadienne. Collection Géographie. Les cahiers du Québec/Hurtubise HMH, Montréal, 1974.

Kurtness, Jacques. Les facteurs psychologiques des parcours de l'acculturation chez les Montagnais du Québec. Thèse de doctorat, École de psychologie, Université Laval, 1983.

Morissonneau, Christian. La terre promise: le mythe du Nord québécois. Montréal. Coll. Ethnologie. Cahier du Québec, Hurtubise HM, 1978.

Muller-Wille. (dir. de publ.) Conflict in development in Nouveau-Québec MSARP nº 37. Centre for Northern Studies and Research. McGill University, Montréal, 1983.

Vachon, Daniel. L'histoire montagnaise de Sept-Îles. Éditions Innu. Sept-Îles, 1985.

VINGT-CINQ ANS D'ARCHÉOLOGIE AU SAGUENAY-LAC SAINT-JEAN

Jean-François Moreau
Groupe des études amérindiennes, Université du Québec à Chicoutimi

Résumé: Le développement de l'archéologie au Saguenay Lac St-Jean s'inscrit parfaitement à l'intérieur de l'histoire de la discipline à l'échelle du Québec. Elle fut d'abord prise en charge dès le début des années soixante par des amateurs dont l'oeuvre de pionnier demeure encore capitale pour le développement actuel de la préhistoire. A la fin des années soixante, les universités et le ministère des affaires culturelles viennent encadrer l'enseignement de la discipline, le développement de la recherche fondamentale et la gestion des ressources archéologiques. Au cours des années soixante-dix, alors que se développe l'archéologie de contrats dans le cadre de législations successives orientées de plus en plus vers la prise en charge du patrimoine par les intervenants locaux, la recherche fondamentale tend à reposer de plus en plus sur un partage des responsabilités entre municipalités, ministère des affaires culturelles et universités. A ce jour, ces programmes de recherche ont permis de mettre au jour des occupations couvrant le laps de temps depuis la période historique récente (régime anglais) jusqu'à la période préhistorique de l'Archaïque récent (1 000 avant notre ère environ). Toutefois les connaissances du paléoenvironnement permettent de croire que des occupations plus anciennes existent au Saguenay Lac St-Jean puisque le glacier wisconsinien se trouve au nord du lac il y a 9 500 ans environ et que la forêt mixte caractérise la région depuis 6 000 ans environ. Il reste à trouver ces occupations anciennes; il reste aussi à préciser leur nature ainsi que celle des plus récentes.

Abstract: Archaeology in the Saguenay Lac St-Jean area adequately reflects the history of the discipline in Québec. At the beginning of the 1960's, local amateur archaeologists conducted archaeological diggings and surveys which resulted in the accumulation of artefact collections still basic to the current development of research. At the end of the 1960's, universities and the Ministère des affaires culturelles began programs in university teaching and research as well as in management of archaeological resources. During the 1970's, a series of bills, more and more oriented toward local responsibility, saw the emergence of contract archaeology paralleling "fundamental" research projects based on intensive collaboration between municipalities, the Ministry and universities. All these works result in a chronological coverage from the late historic time period (the so called "English régime") to late prehistoric occupations (Late Archaic period) about 1 000 years B.C. However, paleoenvironmental studies demonstrate that the region could have supported humans well before the first millenium B.C. since the Wisconsin ice sheet was located north of Lake St-Jean about 9 500 years ago and the actual mixed forest colonized the region about 6 000 years ago. However, these presumed early occupations have not been yet found; moreover, there is plenty of work to be done regarding the very nature, not only of these possible old occupations, but also for the more recent ones which are known but which have not been excavated and analyzed.

La prise en charge de leur patrimoine archéologique par les Québécois est un phénomène aussi récent que les changements sociaux communément dénommés «révolution tranquille». Avant 1960, à peu près toute la recherche archéologique entreprise au Québec l'avait été en fonction de questions soulevées ailleurs (Ontario, Nouvelle-Angleterre), généralement par des chercheurs provenant de ces régions (Martijn 1978, 1979; Cinq-Mars et Martijn, 1981).

A partir de 1960 environ émergent des sociétés d'histoire et d'archéologie qui catalysent les efforts d'individus, généralement des amateurs (ils ne gagnent pas leur pain à mener ces activités), dont certains étaient très éclairés. La région du Saguenay-Lac Saint-Jean ne fait pas exception puisque, dès cette époque, autour du lac lui-même, le notaire Fortin localisait près d'une centaine de sites archéologiques et en rapportait des collections de surface aujourd'hui encore l'objet d'analyses poussées (voir Simard, 1985). Au Saguenay, l'abbé Robert Simard localisait de nombreux sites. On lui doit aussi les premières fouilles dans la région d'un site préhistorique majeur à l'embouchure de la rivière Métabetchouan (DcEx-1: voir Simard 1970) et de deux postes de traite, ceux de Chicoutimi (voir l'analyse de Chapdelaine, 1984, 1985a, et de Lapointe, 1985a et 1985b) et de l'Ashuapmouchouan (Simard, 1979).

Au cours des années soixante, c'est dans les universités que se développèrent progressivement l'anthropologie et, avec elle, l'archéologie: à l'Université McGill d'abord, à l'Université de Montréal ensuite, puis dans le réseau de l'Université du Québec (Montréal, Trois-Rivières, Chicoutimi). Ici, l'abbé Jean-Paul Simard a poussé tout particulièrement le développement des travaux ethnohistoriques, entre autres par le truchement de la collection Tekouerimat dédiée à la reproduction commentée de textes d'époque, et à des travaux de linguistique. La collection compte actuellement 8 titres.

J.-P. Simard a jeté les fondements de l'idée du Saguenay comme «chasse gardée» des Porcs-Épics ou «Kak8chack» (Simard, 1983). Historien régional de haute renommée, J.-P. Simard suggère dans cette thèse que les Kak8chack (un sous-groupe des Montagnais) jouaient le rôle d'intermédiaires entre les Européens de Tadoussac et les populations amérindiennes de l'intérieur (du Lac Saint-Jean à la Baie James) en acheminant le flot des marchandises circulant sur le Saguenay entre 1550 et 1650 environ. C. Larouche (1987) montre qu'à plus d'un point de vue cette thèse est sujette à caution. Ainsi semble-t-il que J.-P. Simard ait erronément étendu l'aire géographique habituelle des Kak8chack du Sud-ouest du Lac Saint-Jean jusqu'au Saint-Laurent, alors que leur répartition semble plutôt réduite au premier endroit. Par ailleurs, il paraît assez douteux qu'une population de cueilleurs-chasseurs-pêcheurs ait pu aussi rapidement assimiler et systématiser un comportement commercial à l'image de celui des Européens.

A partir de 1972, le Québec se dote de lois assurant un traitement adéquat du patrimoine archéologique. D'abord, la loi sur les biens culturels à énoncé, de façon générale, les soins à accorder aux trouvailles archéologiques (rapports des découvertes au Ministère des Affaires culturelles (M.A.C.), éventuels travaux par les spécialistes). Vers 1978, ensuite, est promulguée la loi sur la qualité de l'environnement, qui oblige tout promoteur d'ouvrage à évaluer les risques de perturbations du patrimoine archéologique par les travaux envisagés. C'est en se fondant sur cette base législative que certains organismes ont décidé d'engager leur propre archéologue (Hydro-Québec, Ministère des Transports du Québec); c'est aussi cette législation qui a obligé les promoteurs à financer les recherches entreprises

dans les sites archéologiques touchés par les travaux projetés (Baie James, Gazoduc: voir S.E.B.J., 1985). Au Lac Saint-Jean, la régulation du niveau du lac par la société Alcan, dans le cadre du programme d'alimentation énergétique de ses usines d'électrolyse, a entraîné une étude de potentiel archéologique, associée à l'étude générale de la question des berges du Lac Saint-Jean (Archéotec, 1982). Au Saguenay, l'établissement d'une nouvelle autoroute-route rapide entre Alma et La Baie a aussi donné lieu, récemment, à une étude de potentiel archéologique (Larouche et Moreau, 1986).

Au début des années quatre-vingt, la loi sur les municipalités régionales de comté (M.R.C.) est venue compléter celle des biens culturels et celle de l'environnement en remettant aux autorités proches (municipalités ou regroupement de municipalités) la responsabilité de la gestion du patrimoine archéologique. C'est dans ce contexte qu'une première expérience de collaboration Ministère des Affaires Culturelles-municipalités-universités fut tentée en Haute Côte-Nord, à Grandes-Bergeronnes. Au partage des rôles correspond celui des responsabilités financières (voir Moreau et coll., 1984, 1985, et Plumet et coll., 1986; voir aussi Moreau, 1985a). Par ailleurs, une telle organisation assure que non seulement la recherche archéologique ait lieu, mais encore que l'exploitation des données ainsi mises au jour soit faite rapidement après la découverte scientifique.

Ce modèle de collaboration a été transposé dans la région du Saguenay-Lac Saint-Jean pour le projet de reconnaissance dans la région de la rivière Ashuapmouchouan en 1985–1987 (voir Laliberté, 1986) ainsi que pour le projet de fouilles du site préhistorique-historique DcEx-1 actuellement en cours de réalisation (1986–1989) à l'embouchure de la rivière Métabetchouan, précédé d'un inventaire en 1984 (Laliberté, 1985a et 1985b). Les projets Ashuapmouchaouan et Métabetchouan font partie d'une problématique globale proposée par la direction régionale du Ministère des Affaires culturelles du Saguenay-Lac Saint-Jean, celle des voies d'échange, de commerce et de communication au cours de l'histoire. Le Lac Saint-Jean lui-même se présente en effet comme une plaque tournante à laquelle on accède des quatre points cardinaux, par cinq rivières majeures: au nord la Mistassini, à l'est la Péribonka, au sud le Saguenay et la Métabetchouan, et à l'ouest l'Ashuapmouchouan. Ce réseau hydrographique est enserré dans une zone écologique de forêts mixtes qui s'étend de part et d'autre du Saguenay, entre son embouchure et le lac Mistassini. Cette zone représente une véritable enclave environnementale, car à l'Ouest (Mauricie), au Nord (Baie James) et à l'Est (Côte-Nord) s'étendent des forêts boréales et des peuplements de conifères.

Dans l'état actuel des connaissances, la forêt mixte s'est installée vers −6 000 («BP»), précédée par une peissière vers −7 900 (Richard, 1985). Auparavant, le retrait final du glacier (−9 500) avait été suivi de la formation de la mer de Laflamme et de sa régression vers −8 500 (Parent et coll. 1985). Des conditions propices aux occupations humaines anciennes existaient donc. Toutefois, les premières occupations bien attestées en stratigraphie ne paraissent pas remonter, dans l'état actuel des recherches en Sagamie*, au delà du premier millénaire avant l'ère chrétienne (−3 000), ce qui n'est pas le cas ailleurs

*Expression proposée par les géographes pour désigner la région écologique englobant le découpage politique du Saguenay-Lac Saint-Jean.

au Québec, où on retrouve des dates plus anciennes (Haute Côte-Nord, Grandes-Bergeronnes: −5 000, voir Moreau, 1985b; Basse Côte-Nord: −7 000, voir Groison, 1985; au moins −5 000 sur la rive sud du Saint-Laurent et dans la plaine Laurentienne, voir Chapdelaine, 1985b).

En Sagamie, les premières occupations connues, à l'Archaïque, présentent une variation importante: certaines se rapprochent de l'Archaïque du Bouclier (tradition culturelle présumée caractéristique de la forêt boréale: Wright 1982), d'autres de l'Archaïque maritime bien connu sur la Côte atlantique (voir Moreau, 1985a, pour son extension en Haute Côte-Nord), d'autres enfin de l'Archaïque Laurentien qu'on retrouve particulièrement dans la plaine du Saint-Laurent, de Montréal à Québec. Il est tentant de croire que la variation importante présentée par ces premières occupations résulte des conditions écologiques particulières de la région. S'il est trop tôt pour qualifier les processus mêmes menant à cette variation (immigration, échanges, rapts, etc.), la présence de matières premières allochtones et autochtones ainsi que les styles du façonnage des outils de pierre taillée particuliers à tel ou tel Archaïque montrent clairement qu'il y a variation parmi les occupations les plus anciennes et indiquent, selon toute vraisemblance, que des réseaux de communication et d'échanges, certains peut-être utilisés ultérieurement pour la traite des fourrures, existaient bien avant que les Européens ne viennent s'établir en Amérique. Les quelques siècles qui précèdent l'arrivée de ces derniers attestent nettement l'interaction des populations amérindiennes. Au Saguenay-Lac Saint-Jean, la période Sylvicole supérieure (occupations iroquoïennes) est présente en de multiples sites. Dans certains cas, les études préliminaires suggèrent que la poterie caractéristique de cette période était *fabriquée* sur place avec des argiles locales. La précision de la fabrication et de la décoration ne laisse guère planer de doute sur l'identité iroquoïenne des potiers. Une question fondamentale demeure pour le Sylvicole supérieur: pourquoi des membres d'une population horticole (Iroquoïens) sont-ils venus en Sagamie, alors que les conditions climatiques de cette région (en particulier le nombre de jours consécutifs hors gel) ne permettent guère de faire pousser le principal cultigène, le maïs, que les Iroquoïens utilisaient pour leur subsistance?

Faudrait-il voir là le résultat de pressions (de quel ordre?) qui ont poussé les Iroquoïens vers le nord, cela avant même la traite des fourrures, alors que souvent celle-ci est considérée comme le moteur de l'expansion territoriale de la population iroquoise vers les régions septentrionales (voir Delâge, 1985)?

Vers le milieu du 17e siècle, la présence de plusieurs postes de traite autour du Lac Saint-Jean et le long de ses principaux tributaires permet de cerner, au moins partiellement, certains aspects de la traite des fourrures. D'une façon intuitive, il semble que les nomades algiques de la région (Montagnais) n'ont guère été touchés par l'influence européenne avant le 18e siècle, sinon même le 19e siècle. Entre le moment de l'arrivée attestée du premier Blanc en Sagamie (1647) et celui de la constitution des réserves (autour de 1850: Bouchard et St-Hilaire, 1983) s'écoulent deux siècles au cours desquels les populations montagnaises n'ont pas perdu leur mode de vie nomade de chasseurs-cueilleurs-pêcheurs. Par contraste, certaines populations horticoles de Nouvelle-Angleterre (Iroquois) et d'Ontario (Hurons, Neutres) ont été très rapidement en butte aux exactions des agriculteurs anglais qui n'ont pas trouvé d'autres solutions au problème posé par les Amérindiens que de les réduire (du latin *reductio*: mettre de côté, mettre en réserve spatialement et idéologiquement, voir Delâge, 1985 et Kupperman, 1980). Au Nord du Saint-Laurent, la faible expansion territoriale des Blancs pour fins de colonisation, aux 17e et 18e siècles,

a probablement permis de reculer l'échéance d'une dépendance totale des réserves. Une série de questions demeure cependant. Ainsi, si les populations horticoles du Nord-est américain ont été décimées jusqu'à moins de 50% de leur nombre par de grandes épidémies entre 1550 et 1650 environ, qu'en a-t-il été des populations de chasseurs-cueilleurs-pêcheurs? Ont-elles été naturellement protégées par leur densité moindre que les populations horticoles, ou par leurs habitudes nomades? Par ailleurs, à population égale (ou, à fortiori, moindre) ces populations nomades accrurent-elles de façon significative leur récolte de peaux pour la traite? Cette augmentation en vint-elle à perturber le mode de vie traditionnel ou, encore, la technologie introduite par les Blancs (fusils, haches) a-t-elle multiplié les effets de cette augmentation? Ce sont là toutes des questions non résolues à ce jour. S'il reste beaucoup de travail à faire, il est acquis que l'archéologie sagamienne permet d'éclaircir les processus de peuplement et de contact entre les populations tant anciennes que récentes. Il reste à souhaiter que le dynamisme qui l'a caractérisée jusqu'à ce jour se maintienne dans l'avenir.

Bibliographie

Archéotec, 1982, Programme de stabilisation des berges du Lac Saint-Jean. Etude d'impact sur l'environnement et le milieu social. Annexe 10. Potentiel archéologique, Alcan, rapport inédit.

Bouchard G. et M. St-Hilaire, 1983,: Les Amérindiens du Saguenay à l'époque contemporaine in C. Pouyez et Y. Lavoie (dir. de publ.), Les Saguenayens, Québec, Presses de l'Université du Québec.

Chapdelaine C., 1984, Un campement préhistorique au pays des Kak8chak ou Porcs-Épics: le site de Chicoutimi (DcEs-1), Chicoutimi, Direction régionale du Saguenay-Lac Saint-Jean, Ministère des Affaires culturelles, rapport inédit.

— 1985a, Les Iroquois de la province de Canada au Royaume du Saguenay: alliances, foire ou diaspora à Chicoutimi, Saguenayensia, 27(4): 176–180.

— (dir. de publ.), 1985b, La période paléoindienne, Recherches Amèrindiennes au Québec, 15(1–2).

Cinq-Mars J. et C. Martijn, 1982, History of Archaeological Research in the Subarctic Shield and Mackenzie Valley, in J. Helm (ed.), Handbook of North American Indians. Vol. 6, Subarctic: 30–34, Washington, Smithsonian Institution.

Delâge D., 1985, Le pays renversé, Montréal, Boréal Express.

Groison D., 1985, Blanc-Sablon et le Paléo-Indien au détroit de Belle-Isle, Recherches Amérindiennes au Québec, 15(1–2): 127–134.

Laliberté M., 1985a, Inventaire archéologique des berges de la rivière Métabetchouan, Chicoutimi, Direction régionale du Saguenay-Lac Saint-Jean, Ministère des Affaires culturelles.

— 1985b, Occupations et échanges autochtones sur la rive gauche de la Métabetchouan, Saguenayensia, 27(4): 172–175.

— 1986, Inventaire archéologique du bassin de la rivière Ashuapmouchouane, Lac Saint-Jean, 1985, Chicoutimi, Direction régionale du Saguenay-Lac Saint-Jean, Ministère des Affaires culturelles, rapport inédit.

Lapointe C., 1985a, Un établissement commercial sur la route des fourrures du Saguenay-Lac Saint-Jean, Chicoutimi, Direction régionale du Saguenay-Lac Saint-Jean, Ministère des Affaires culturelles, rapport inédit.

— 1985b, Les vestiges du poste de traite de Chicoutimi: des bâtiments, des objets, des ossements . . . et des hommes, Saguenayensia, 27(4): 184–189.

Larouche C., 1987, Contribution à la préhistoire du Lac Saint-Jean, mémoire de maîtrise qui sera présenté au Département d'Anthropologie de l'Université de Montréal, Montréal.

Larouche C. et J.-F. Moreau, 1986, Étude d'impact sur l'environnement. Autoroute 70/route 170. Etude de potentiel archéologique, Chicoutimi, Polytech, rapport inédit.

Martijn C., 1978, Historique de la recherche archéologique au Québec, Recherches amérindiennes au Québec, 7(1-2): 11-18.

— 1979, Archaeological Research in Québec: an Historical Overview, Man in the Northeast, 18:3-13.

Moreau J.-F., 1985a, L'exploitation préhistorique des ressources dans l'estuaire du Saint-Laurent, in Traditions maritimes au Québec: 69-83, Québec, Commission des biens culturels.

— 1985b, L'occupation préhistorique à Grandes-Bergeronnes, La revue d'histoire de la Côte-Nord, 3:8-10.

— G. Tassé et P. Plumet, 1984, École de fouilles de Grandes-Bergeronnes. Activités 1983-84., Montréal, Université du Québec à Montréal, Laboratoire d'archéologie, rapport inédit.

— G. Tassé, M.-F. Archambault, H. Gauvin et P. Plumet, 1985, École de fouilles de Grandes-Bergeronnes. Activités 1984-85, Montréal et Chicoutimi, Université du Québec, Laboratoires d'Archéologie, rapport inédit.

Parent M., J.-M.M. Dubois, P. Bail, A. Larocque et G. Larocque, 1985, Paléogéographie du Québec méridional entre 12 500 et 8 000 ans B.P., Recherches Amérindiennes au Québec, 15(1-2): 17-38.

Plumet P., H. Gauvin, M.-F. Archambault, G. Tassé et J.-F. Moreau, 1986, Ecole de fouilles de Grandes-Bergeronnes. Activités 1985-1986., Montréal et Chicoutimi, Université du Québec, Laboratoires d'archéologie, rapport inédit.

Richard P., 1985, Couvert végétal et paléoenvironnement du Québec entre 12 500 et 8 000 BP. L'habitabilité dans un milieu changeant. Recherches Amérindiennes au Québec, 15(1-2): 39-56.

Simard J.-P., 1983, Les Amérindiens au Saguenay avant la colonisation blanche in C. Pouyez et Y. Lavoie (dir. de publ.), Les Saguenayens: 67-94, Québec, Presses de l'Université du Québec.

Simard R., 1970, Le site de Métabetchouan, Lac Saint-Jean. Rapport préliminaire, Chicoutimi, Société d'Archéologie du Saguenay, rapport polycopié.

— 1979, Le poste de traite d'Ashuapmouchouan. Dossiers de recherche, Chicoutimi, Groupe des Études amérindiennes, rapport polycopié.

— 1985, Le notaire Fortin et l'histoire de l'archéologie au Saguenay-Lac Saint-Jean, Saguenayensia, 27(4): 168-171.

Wright J.V., 1982, Prehistory of the Canadian Shield, in J. Helm (ed.), Handbook of North American Indians., Vol. 6, Subarctic: 86-96, Washington, Smithsonian Institution.

LA RECHERCHE EN RESSOURCES MINÉRALES À L'UNIVERSITÉ DU QUÉBEC À CHICOUTIMI

G. Woussen
Université du Québec à Chicoutimi

Résumé: La géologie du Précambrien et les ressources minières représentent un axe de développement privilégié pour l'Université du Québec à Chicoutimi (UQAC). Cet axe a été conforté au cours des années par une recherche vigoureuse et par le développement d'une programmation d'enseignement complète du premier au troisième cycles.

Récemment, les chercheurs en géologie, qui appartiennent aussi au Centre d'études sur les ressources minérales (CERM), ont élaboré un programme de recherche d'envergure qui sera financé par le ministère de la Science et de la Technologie du Québec et par des contrats du ministère de l'Énergie et des Ressources du Québec.

Les activités des chercheurs sont concentrées dans deux secteurs du Précambrien du Bouclier canadien qui leur servent de laboratoires d'études privilégiés: 1) la ceinture archéenne des schistes verts des régions de Chibougamau-Noranda-Val d'Or, et 2) la région du Saguenay-Lac Saint-Jean de la Province de Grenville, qui est d'âge protérozoïque. Les travaux de recherches sont concertés et occupent neuf professeurs, quatre professeurs-chercheurs subventionnés, une quinzaine d'étudiants diplômés et plusieurs assistants de recherche. Dans la Province du Supérieur, les travaux, en cours depuis 1971, ont permis d'élaborer des modèles généraux de l'évolution paléogéographique, tectonique et métallogénique de cette ceinture de roches vertes.

Dans la Province de Grenville, les données recueillies depuis 1979 dans la zone centrale ont permis de réinterpréter le cadre géotectonique, de proposer un modèle d'évolution de cette province structurale, et de formuler des hypothèses sur la formation sur certains massifs d'anorthosites.

L'objectif principal de ce programme de recherche est d'accroître la masse des connaissances géologiques et de faciliter l'élaboration d'une stratégie et de tactiques d'exploration minière. Les modèles géologiques et métallogéniques qui sont ainsi élaborés au niveau régional sont d'application générale dans des régions similaires, ailleurs au Canada et dans le monde.

Abstract: Precambrian geology and mineral resources form a very special focus for l'Université du Québec à Chicoutimi (UQAC). This focus has been nurtured over the years by vigorous research and by the development of a teaching program from the First through the Third Cycles. Recently, research geologists at UQAC, also associated with le Centre d'études sur les ressources minérales (CERM), have developed a major program of research financed by le Ministère de la Science et de la Technologie du Québec and by contracts from le Ministère de l'Énergie et des Ressources du Québec. These researchers' activities

are centred on two sectors of the Precambrian Canadian Shield which form special laboratories for them. These are 1) the belt of Archaean green schists of the Chibougamau-Noranda-Val d'Or regions and 2) the region of Saguenay-Lac Saint-Jean in the Grenville Province which is Protozoic in age. These research programs are well coordinated, involving nine professors and four research professors, fifteen graduate students and several research assistants. In the Superior Province, researches in progress since 1971, have allowed the development of several models of the palaeogeographic, tectonic and metallogenic evolution of this belt of green rocks. In the Grenville Province, data gathered in the central zone since 1979 have allowed the reinterpretation of the geotectonic framework, the development of a model of the evolution of this structural province and the formulation of the hypotheses of the mode of formation of certain anarthosite massifs.

The principal objective of this research program is to increase the corpus of geological knowledge and to facilitate the development of mineral exploration strategies and tactics. Geological and metallogenic models developed at this regional level are of general application in similar regions elsewhere in Canada and the world.

La recherche des ressources minières: un besoin économique du Québec et de ses régions périphériques

Les produits miniers se tiennent au premier rang des exportations chargées au Québec, tandis que le secteur économique des ressources minières (extraction et affinage) occupe le second rang (Gouvernement du Québec, 1984).

Pourtant, l'industrie minière du Québec se trouve dans une situation critique à l'heure actuelle. Malgré une augmentation de valeur de la production, qui a pratiquement triplé au cours des années 70, le volume de cette production a décru de façon sensible. Ce déclin a particulièrement affecté le secteur des métaux de base. Par suite du ralentissement de l'extraction des minerais de fer, de zinc, de cuivre et d'or, le volume des activités d'affinage a aussi baissé. Cette situation découle non seulement de l'épuisement des gîtes minéralisés, mais aussi de la difficulté croissante de trouver de nouvelles sources d'approvisionnement qui soient concurrentielles sur le marché mondial des métaux.

Le secteur économique des ressources minières, en particulier l'extraction et l'affinage des métaux, est concentré dans quelques régions périphériques. Ce secteur économique a toujours eut une importance particulière pour le développement des régions où les ressources minières ont souvent été le facteur principal du peuplement. L'exploitation des ressources minières demeure le moteur principal de l'organisation sociale et économique de régions pionnières comme Chibougamau, l'Abitibi-Témiscamingue et plusieurs secteurs de la Côte-Nord. Le devenir et l'évolution socio-économique de vastes régions du Moyen-Nord ou du Nord québécois sont donc encore largement conditionnés par la vigueur et la santé du secteur des ressources minières.

Une Université périphérique comme l'UQAC se devait de contribuer au développement d'un domaine vital comme les ressources minières, puisqu'elle se trouve à la porte des régions médionordique et nordique du Québec.

Historique de la recherche en ressources minières à l'UQAC

Au cours de ses premières années d'existence, l'Université du Québec à Chicoutimi choisit une orientation privilégiée de développement: la géologie du Précambrien, et procéda à l'embauche progressive des professeurs nécessaires à la mise en oeuvre des programmes d'enseignement et de recherche pertinents. L'Opération sciences appliquées (OSA) conforta cette orientation en permettant la poursuite du programme de génie géologique et en favorisant la création, en 1975, d'une maîtrise en géologie du Précambrien. Finalement, la mise en oeuvre, en mai 1986, d'un programme de doctorat en ressources minières, de concert avec l'Université du Québec à Montréal (UQAM), couronna plusieurs années d'efforts en recherche des professeurs de géologie de l'UQAC.

Cette reconnaissance de la recherche en géologie découlait entre autres: 1) des travaux sur la région de Chibougamau, coordonnés par le professeur Guha depuis 1971: 2) des travaux sur la région de l'Abitibi, coordonnés de 1975 à 1985 par le professeur Dimroth et depuis 1986 par le professeur Mueller, et finalement 3) des travaux sur le Grenville central, coordonnés d'abord par le professeur Dimroth (1978–1981), puis par le professeur Woussen.

La région de Chibougamau a été l'objet d'un projet-action spontanée FCAC mené de concert avec le Ministère de l'Énergie et des Ressources du Québec. L'aboutissement de ces travaux s'est traduit, en 1984, par l'organisation d'un Symposium par les professeurs Guha et Chown sur la stratigraphie et la métallogénie de cette région. Ce Symposium se déroula sous l'égide de la division de géologie de l'Institut canadien des mines. Durant cette rencontre, près de 40% des communications présentées découlaient de travaux effectués à l'UQAC. En tout, on a dénombré quinze mémoires de maîtrise et environ trente articles soumis à un comité de lecture, et issus de ce projet de recherche. À propos du projet Chibougamau, il faut aussi mentionner la contribution importante du professeur Chown. Celui-ci, qui était directeur associé de publication pour le Symposium de l'Institut canadien des mines, a poursuivi par ailleurs une réflexion personnelle sur la tectonique et la néotectonique des socles cristallins de l'Archéen et du Grenville. Actuellement, un contrat du ministère de l'Énergie et des Ressources du Québec lui permet d'étendre ses travaux de recherches sur les socles cristallins et leurs relations avec les roches supracrustales.

La région de l'Abitibi correspondait aux intérêts de recherche du professeur Dimroth qui décéda prématurément en 1985. Ses travaux étaient, pour lui, l'occasion d'une réflexion en profondeur sur le volcanisme et la sédimentologie de l'Archéen et du Récent. Cependant, ses intérêts en recherche et la largeur de ses vues débordaient largement le simple cadre de l'Abitibi. Véritable animateur des recherches, il participait non seulement aux trois projets de recherche présentés ici, mais aussi à plusieurs autres projets réalisés au plan international. Les sept thèses de maîtrise qu'il a dirigées et les trente articles scientifiques qu'il a publiés au cours de sa carrière en témoignent de façon éloquente. Le projet Abitibi est maintenant coordonné par le professeur Mueller.

Les premiers travaux sur la Province de Grenville, entrepris en 1978, ont permis la maturation d'une hypothèse sur l'évolution du Grenville central en 1981. Rapidement, elle a été vérifiée, enrichie et étendue à d'autres régions de la Province de Grenville. Un bilan de ces résultats se trouve dans les comptes rendus du Symposium sur le Grenville organisé

par l'Association géologique du Canada en mai 1984, où apparaissent trois contributions de l'UQAC. Le projet Grenville a donné lieu à sept mémoires de maîtrise et à huit articles dans des revues avec comité de lecture.

En intégrant les trois projets de recherche précités, les chercheurs en géologie de l'UQAC, qui appartiennent aussi au Centre d'études sur les ressources minérales (CERM), ont constitué un programme de recherche d'envergure. À ce programme participent neuf professeurs, quatre professeurs-chercheurs subventionnés, une quinzaine d'étudiants diplômés et plusieurs assistants de recherche. Il a débuté en janvier 1986 et il bénéficie d'une subvention du programme d'actions structurantes du Ministère des Sciences et de la Technologie du Québec (1,2 M$ répartis sur cinq ans) et de trois contrats du Ministère de l'Énergie et des Ressources du Québec (environ 0,4 M$/année pendant trois ans).

Ce programme de recherche vise à accroître la masse des connaissances géoscientifiques et à élaborer des synthèses géologiques régionales et métallogéniques. Ces études constituent un préalable indispensable à la diversification et à la mise en valeur du potentiel minier des régions médionordique et nordique du Québec.

Objectif d'ensemble du programme de recherche

L'objectif d'ensemble du programme de recherche en ressources minières comporte deux volets principaux dont les objectifs peuvent être décrits comme suit:

1. Contribuer au développement des connaissances et à l'élaboration de la stratégie d'exploration minière. Il s'agit d'étayer la programmation des campagnes d'exploration minière des entreprises de ce secteur de l'économie, grâce au développement et à l'amélioration des modèles suivants:

a. Évolution paléogéographique et tectono-métamorphique de la ceinture volcano-sédimentaire de l'Abitibi;

b. Évolution tectono-métamorphique de la Province de Grenville;

c. Génèse des divers types de minéralisation qui se trouvent dans ces deux grandes unités géologiques.

2. Étayer les tactiques d'exploration minière. C'est-à-dire, par des études ponctuelles, rechercher de nouvelles réserves minéralisées dans certaines mines existantes. Dans ce cas, des études, tant géomécaniques que métallogéniques, s'imposent.

Les grandes lignes de ce programme sont précisées ci-dessous.

Points essentiels du programme de recherche en cours

I. Avant-propos

1. Relations entre recherche minière et recherche géologique

A ses débuts, la prospection minière était focalisée sur les dépôts minéralisés ayant une expression précise en surface: affleurement ou anomalies géophysiques ou géochimiques.

Durant cette période, l'introduction de chaque nouvelle méthode de prospection géophysique ou géochimique a rapidement conduit à la découverte de nouveaux gisements. Dans la ceinture archéenne de roches vertes Abitibi-Chibougamau, cette phase de prospection s'est achevée au cours des années 70. Dans les régions de cette unité géologique déjà examinées en détail, tout porte à croire que les dépôts ayant une expression claire en surface ont été localisés.

Aujourd'hui, l'industrie minière doit de plus en plus relever le défi de la recherche des minéralisations qui n'ont pas d'expression claire en surface (blind ore bodies). Pour ce faire, l'industrie doit emprunter une approche sophistiquée appelée stratégie d'exploration.

a. La stratégie d'exploration minière

La stratégie d'exploration consiste à intégrer un modèle d'evolution géologique d'une région avec un ou des modèles de la genèse du type de gîte recherché. On peut ainsi distinguer les zones favorables des zones non favorables à la formation d'un type particulier de gisement. Au niveau local, l'intégration des deux modèles permet ensuite de cerner des zones cibles précises pour une prospection plus détaillée. L'intégration de ces différents modèles est aussi déterminante dans le choix des méthodes nécessaires pour préciser les cibles à prospecter en détail. Les techniques d'investigation peuvent inclure: des études géologiques plus approfondies (sédimentologie, volcanologie, tectonique, etc.); des études géophysiques ou géochimiques; des campagnes de forages, ou encore associer certaines de ces méthodes.

b. La tactique d'exploration minière

La tâche de l'industrie minière n'est pas finie après la découverte d'un gisement. En général, l'ouverture d'une mine est entreprise dès que les réserves prouvées permettent l'amortissement de l'investissement initial. La recherche de nouvelles lentilles minéralisées, afin d'augmenter les réserves connues, se fait plus tard lors de l'exploration de la mine. Cette recherche de nouvelles lentilles minéralisées peut être caractérisée par le nom de «tactique d'exploration».

2. Caractère intégré et continu de la recherche

Bien que le programme de recherche soit subdivisé en deux sous-programmes et plusieurs volets, il convient d'accentuer son intégration. Le sous-programme «ceinture volcano-sédimentaire de l'Abitibi» concerne une région où affleurent des roches vertes archéennes précédemment enfouies à des profondeurs ne dépassant pas 5 à 6 km, lors de l'orogénie kénoréenne (-2,7 Ga, ou milliards d'années). Par contre, le sous-programme «Province de Grenville» permet de tirer certaines conclusions au sujet des roches enfouies à des profondeurs de 20 à 30 km lors de l'orogénie Grenvillienne (-1,2 Ga). Ces deux Provinces structurales d'âges, de grades métamorphiques et de styles de déformation différents se retrouvent maintenant côte à côte, et sont séparées par le front Grenville. Bien que des différences intrinsèques existent entre ces deux Provinces géologiques, l'observation de certains phénomènes du deuxième sous-programme (Grenville) permet d'expliquer plusieurs processus qui ont pris place en profondeur sous la ceinture de schistes verts de l'Abitibi.

Les minéralisations de la Province de Grenville, près du front Grenville, sont similaires à celles du Supérieur; elles se trouvent seulement à un grade de métamorphisme plus élevé. Enfin, le problème de la fécondité des plutons est le même pour les deux régions.

II. Recherche dans la ceinture volcano-sédimentaire de l'Abitibi

1. Évolution paléogéographique et tectono-métamorphique

La ceinture de schistes verts de l'Abitibi (C.S.V.A.) peut être subdivisée en une zone interne au Nord et une zone externe au Sud. La zone interne est caractérisée par l'absence de magmatisme ultramafique, par la présence d'un socle (Racicot et coll., 1984) et par un plutonisme important. La zone externe montre un magmatisme ultramafique important, une absence de socle et un plutonisme modeste (Dimroth et coll., 1982). Depuis 1971, nos travaux ont porté sur la région de Noranda-Val d'Or qui constitue un exemple de la zone externe, et sur la région de Chibougamau qui est caractéristique de la zone interne. Ces travaux ont permis d'élaborer un premier modèle généralisé de l'évolution paléogéographique et tectono-métamorphique de la C.S.V.A. (Dimroth et coll., 1982, 1983a,b, 1984b; Racicot et coll., 1984). Ces travaux ont aussi largement contribué à établir une première ébauche de l'évolution métallogénique de la région de Chibougamau et d'identifier de nouvelles avenues de recherche (Guha, 1984). L'évolution paléogéographique, qui est étroitement liée à l'évolution magmatique, se subdivise en trois étapes. Dans une première étape, une chaîne volcanique sous-marine s'édifie au fond de la mer. D'abord des laves peu différenciées s'épanchent à partir de fissures et forment une plaine de lave sous-marine très étendue. Graduellement, des chambres magmatiques se forment et entraînent l'éruption de roches volcaniques différenciées (tholéiitiques et calco-alcalines) à partir des centres volcaniques. Les chambres magmatiques, en se consolidant, deviennent des plutons synvolcaniques. Les produits des éruptions de flanc et des éruptions centrales se distinguent par leurs caractéristiques chimiques. Les centres volcaniques émergent progressivement et deviennent des îles volcaniques. Un peu plus tard, leur densité moyenne étant diminuée par l'intrusion de plutons felsiques subvolcaniques, les centres volcaniques se soulèvent. En même temps, des bassins et des failles de direction E-O s'enfoncent et sont remplis par du matériel détritique provenant de l'érosion des îles volcaniques. Ces îles sont ensuite érodées jusqu'au niveau des plutons subvolcaniques et du socle. Le volcanisme associé à cette phase d'érosion est de type shoshonitique.

Cette évolution paléogéographique a créé un terrain très anisotrope et hétérogène; en particulier, il contient des noyaux consolidés (c.-à.-d. les centres volcaniques et leurs plutons synvolcaniques) et des cassures de direction est-ouest. Lors de la déformation kénoréenne, la première phase de plis F1 se moule autour de ces noyaux consolidés, et les fractures est-ouest sont transformées en failles de chevauchement. Les plis F2 de deuxième phase ont une direction plus régulière E-O. Le système de schistosité et de plis superposés (S3, S4, F3, F4, kinks) n'est important que localement. Une tectonique diapirique, due aux mouvements verticaux des masses plutoniques pré- syn- et post-tectonique (Racicot et coll., 1984) interfère avec ces plissements.

Enfin, les failles de décrochement sénestre de direction E-N-E et leurs failles secondaires associées ne sont plus d'âge kénoréen, mais se développent tard dans l'Archéen et tôt dans le Protérozoïque (Dimroth et coll., 1984a; Archambault et coll., 1984).

2. Évolution métallogénique de la ceinture volcano-sédimentaire de l'Abitibi.

La C.S.V.A. contient sept types de dépôts minéralisés qui peuvent être décrits comme suit: 1) dépôts de Ni-Cu associés aux roches ultramafiques; 2) dépôts de magnétite vanadifère dans les complexes ignés stratiformes; 3) dépôts de sulfures massifs volcanogènes; 4) dépôts de porphyres cuprifères; 5) dépôts de Cu-Au en veines; 6) dépôts d'Au en plusieurs associations; 7) dépôts de Mo-Li-Be associés à certains plutons. Les types 1), 2) et 7) ont actuellement peu d'importance économique, aussi limitons-nous les recherches aux types 3) à 6) qui sont tous d'origine hydrothermale.

a. Dépôts de sulfures massifs volcanogènes

Les facteurs de minéralisation de ce type de gisement sont maintenant bien connus. D'après Knuckey et Watkins (1982), Knuckey et coll., (1982) et Dimroth et coll., (1984b), ces types de dépôts sont reliés à des failles synvolcaniques, envahies par des intrusions subvolcaniques. Les intrusions subvolcaniques sont la source de la chaleur qui déclenche le processus hydrothermal et les failles synvolcaniques évacuent une décharge focalisée des solutions. Des facteurs stratigraphiques et paléotopographiques interviennent également (Spence et Spence, 1975; MacLean, 1984); les dépôts se forment souvent juste après l'effondrement d'une caldeira, et sont drapés sur les dômes de rhyolites.

Présentement, on ignore pourquoi certains centres volcaniques (Noranda, Mattagami) renferment un grand nombre de dépôts de sulfures massifs, tandis que d'autres centres paraissent stériles. Les études comparatives de l'évolution des centres volcaniques, du volet paléogéographie, contribueront à résoudre ce type de problème.

b. Gîtes de type porphyrique et filons épithermaux de métaux précieux.

La formation de porphyres cuprifères dans la région de Chibougamau (Cimon, 1973, 1976; Guha et coll., 1984) semble liée à l'évolution tardive d'un pluton synvolcanique (Bureau, 1980; Bureau et coll., 1979; Racicot, 1980; Guha, 1984). Il semble également que certaines minéralisations épithermales soient liées à cet événement (Pilote et coll., 1984; Guha, 1984). Il faut cependant mentionner que la période de mise en place des porphyres cuprifères, ainsi que la relation génétique entre les minéralisations de ce type observées dans plusieurs zones du pluton de Chibougamau sont encore très mal connues. Des études comparatives plus approfondies de la tectonique, de l'altération, des inclusions fluides ainsi que de la géochimie isotopique (Pb, S, H, O), sont nécessaires pour résoudre ces problèmes.

c. Dépôts de Cu-Au en veines

Les recherches des dernières années (Guha et coll., 1984; Archambault et coll., 1984; Bertoni et Vachon, 1984; Salmon et coll., 1984) ont montré que le modèle de mise en place de ces dépôts par mobilisation métamorphique préconisé par Guha et coll. (1979) et Arnold et Guha (1980) s'applique intégralement à tous les dépôts de Au-Cu du complexe du lac Doré (Chibougamau) et de Chapais. La datation de ces dépôts à l'Archéen tardif et au Protérozoïque précoce repose d'une part sur la chronologie des événements relatifs à la déformation kénoréenne (Dimroth et coll., 1984) et d'autre part sur le système isotopique du plomb (Thorpe et coll., 1984). La corrélation nette entre l'évolution géomécanique des zones de cisaillement et l'évolution des fluides minéralisateurs est l'une des caractéristiques de ces dépôts (Guha et coll., 1983).

Plusieurs questions concernant ces dépôts restent cependant à résoudre, soit: 1) le processus exact provoquant la porosité des fractures lors du cisaillement; 2) la relation d'âge et la relation mécanique entre les dépôts de la faille Henderson-Portage, ceux associés à la faille du lac Doré et les nouvelles minéralisations au Sud du lac Chibougamau; 3) la nature du processus de mobilisation (métamorphisme ? ou intrusions ?); et 4) la provenance des élements concentrés (préconcentration sédimentaire ? ou volcanique ?).

d. Dépôts d'or

Les dépôts d'or de la C.V.S.A. montrent la plus grande variabilité de toutes les minéralisations de l'Abitibi. Leur seul point commun est la localisation de la plupart d'entre eux (> 95%) à moins de 5 km des grandes failles E-O, comme la faille Cadillac au Sud de la ceinture ou la faille Guercheville au Nord de celle-ci. Pour le reste, il s'agit tantôt de dépôts stratiformes, apparemment exhalatifs (par exemple, la mine Bousquet; Valiant et coll., 1982), tantôt de veines pré-kénoréennes (par exemple, la mine Doyon; Guha et coll., 1982) ou encore de cheminées de brèche kénoréennes (par exemple, la mine Chadbourne; Walker et Gregheur, 1982). D'autres dépôts sont liés à des intrusions alcalines (par exemple, la mine Bachelor; Bureau, 1984). Plusieurs exemples montrent la possibilité d'existence de filons aurifères d'âges différents (cf. Tableau 1, Guha, 1984 pour la région de Chibougamau). Face à cette situation, aucun modèle unique ne peut s'appliquer à tous les cas. Pour clarifier l'origine de ces dépôts, il faudrait: 1) étudier plus en détail la volcanologie, la sédimentologie et le rôle des grandes failles E-O, et 2) étudier en détail la volcanologie, la sédimentologie, la tectonique, les altérations, les inclusions fluides et la géochimie d'un grand nombre de ces dépôts.

III. La recherche dans la Province de Grenville

1. Évolution tectono-magmatique de la Province de Grenville

La Province de Grenville (P.G.) est une zone mobile polycyclique qui a subi une évolution tectono-magmatique complexe. La dernière phase de métamorphisme et de déformation qui a affecté cette Province est l'orogénèse grenvillienne, il y a environ 1.2 Ma (Wynne-Edwards, 1972; Baer 1976). Suite à nos travaux récents, (Woussen et coll., 1986; Rivers et Chown, 1986) nous avons proposé une nouvelle division géotectonique de la P.G. en trois zones: 1) la zone d'avant-pays; 2) la zone marginale, et 3) la zone interne. La zone d'avant-pays, qui consiste en un socle archéen, localement surmonté par des lambeaux de roches aphébiennes, a été faiblement affectée par l'orogénie grenvillienne. Le front du Grenville marque la transition entre la zone d'avant-pays et la zone marginale. Cette dernière est caractérisée par des chevauchements majeurs vers le N-O qui, comme l'indique la présence de saphirine et d'hypersthène, ont provoqué un épaississement double de la croûte. La zone interne consiste largement en un terrain igné polycyclique, de chronologie très complexe (Dimroth et coll., 1981; Roy et coll., 1986). Dans cette zone, la tectonique verticale engendrée par la mise en place des plutons granitiques post-hudsoniens, des suites anorthosite-mangérite et des granites syn- ou tardi-grenvilliens joue un rôle considérable (Woussen et coll., 1981; 1986).

Les travaux entrepris depuis 1978 concernent surtout la zone interne de la P.G. La chronologie des événements ignées et métamorphiques a d'abord été établie dans la région

de Chicoutimi et sur la Basse Côte-Nord (Dimroth et coll., 1981). Cette chronologie des événements s'étend maintenant progressivement de Dolbeau à Tadoussac (Tremblay, 1984), et elle devra être complétée dans les années à venir.

Un autre problème majeur de la zone interne est l'étude des masses plutoniques qui occupent près de 70% de la superficie de cette zone. Ces travaux ont débuté par une étude de la pétrogénèse de l'anorthosite du Lac Saint-Jean et des roches basiques qui lui sont associées (Woussen et coll., 1981; Woussen et coll., soumis; Côté et Woussen, 1986) et de quelques massifs de granites III et IV. Les dykes d'amphibolites II, qui sont omniprésents dans le complexe de gneiss, représentent vraisemblablement une phase d'extension majeure entre l'orogénie hudsonienne et l'orogénie grenvillienne et devront être étudiés en détail du point de vue chimique. Cet effort permettra de préciser leur contexte tectonique de mise en place et également de vérifier un lien génétique possible entre ces dykes basiques et le massif d'anorthosite du Lac Saint-Jean.

Des travaux ponctuels en tectonique et en géothermobarométrie ont également été entrepris afin de contrôler les styles tectoniques et, en particulier, les mouvements verticaux de masses (thèses de MSc de Lapointe, 1984; Corriveau, 1982).

La zone marginale entre le Lac Saint-Jean et la région de Chibougamau est pratiquement inconnue. Une étude du front Grenville dans la région de Chibougamau, entreprise en collaboration avec la Commission géologique du Canada, vise à étendre à cette région les travaux de Rivers et Chown (1986).

2. Métallogénie de la Province de Grenville

La P.G. est réputée pauvre en dépôts minéralisés; par conséquent, sa métallogénie est mal connue. Pourtant, à proximité du front Grenville, la P.G. consiste de roches archéennes remobilisées qui pourraient renfermer les mêmes types de dépôts que dans la C.S.V.A., bien qu'à l'état fortement métamorphisé et déformé (Sethuraman, 1984). Les études sur la chronologie des événements dans le complexe gneissique contribueront à circonscrire les terrains favorables à ce type de gisement.

La Province de Grenville a cependant son propre cortège de dépôts, soit: 1) les dépôts de titane associés aux massifs d'anorthosite (par exemple, le lac Tio); 2) les dépôts d'uranium liés aux pegmatites et aux granites; 3) les minéralisations Cu-Au associées à des zones de cisaillements tardi-grenvilliens (par exemple, aux Grandes-Bergeronnes); 4) les dépôts de niobium et de terres rares reliés aux carbonatites (par exemple, celui de Saint-Honoré) et, enfin, 5) les minéraux industriels tels que la silice (par exemple, La Galette), le mica et les feldspaths. L'origine des dépôts de titane et d'uranium est largement liée à la pétrogénèse des anorthosites et des granites, avec leur cortège pegmatitique. Des études pétrogénétiques sur ces massifs contribueront donc à circonscrire les terrains favorables à la prospection de ce type de dépôts (voir, par exemple, Fowler et Doig, 1983).

Une autre caractéristique affecte fortement l'exploitation des dépôts minéralisés (par exemple, Montauban-les-Mines) et des gisements de minéraux industriels dans la P.G.: le taux de déformation très élevé des roches. Des études tectoniques régionales et ponctuelles sont donc nécessaires afin d'étayer la tactique d'exploitation.

Conclusions

Comme le montrent les articles publiés depuis une dizaine d'années dans des revues scientifiques, quatre lignes de force caractérisent l'approche préconisée en recherche par les professeurs de géologie de l'UQAC:

1) Concerter les études de plusieurs disciplines lors de l'étude d'une région donnée. Pour réaliser cette intégration, chaque membre de l'équipe (incluant les étudiants diplômés) doit acquérir une bonne connaissance de la géologie de cette région, ce qui entraine aux synergie d'équipe.

2) Les études de terrain sont toujours un préalable essentiel aux études en laboratoire, ce qui permet un échantillonage judicieux du ou des problèmes à résoudre.

3) Les études fondamentales en laboratoire (par exemple, la pétrographie, la minéragraphie), précèdent toujours les méthodes d'investigation plus sophistiquées (par exemple, la géochimie, les études à la microsonde ou l'étude des inclusions fluides, etc..).

4) Aux trois premières caractéristiques s'ajoutent maintenant le souci de quantifier de plus en plus l'analyse des processus géologiques; c'est-à-dire de modéliser les phénomènes géologiques sur ordinateur. Cette quantification sera d'abord appliquée au domaine de la tectonique par l'utilisation des méthodes d'analyse par éléments finis. Elle sera ensuite étendue à d'autres domaines de la géologie. Cette approche méthodologique a permis d'élaborer des modèles géologiques et métallogéniques pour des régions circonscrites des provinces structurales du Supérieur et du Grenville du Bouclier canadien. Ces modèles, bien que fondés sur des études régionales, sont applicables à d'autres secteurs du Bouclier canadien, ou encore à des régions similaires dans le monde.

Remerciements

Cet article n'aurait pu être écrit sans les travaux de recherche de l'équipe de professeurs de géologie de l'UQAC; ces travaux, il faut le souligner, ont parfois été effectués dans des conditions particulièrement difficiles. Cette équipe comprend les anciens: Archambault G., Carignan J., Chown E.H., Du Berger R., Guha J., Roy D.W., Woussen G.; et les nouveaux: Barnes S., Cousineau P., Higgins M., Hugon H., Mueller W., Rouleau A., Sawyer E.

Un souvenir ému à Erich Dimroth qui a toujours su nous rappeler que la recherche était partie intégrante des activités universitaires.

Bibliographie

Archambault G. (1985) A discussion of Hubert et al., (1984), Archean Wrench Fault Tectonics and Structural Evolution of the Blake River Group: Canadian Journal of Earth Sciences, v. 23: 943.

Archambault G., Guha J., Tremblay A. and Kawar R. (1984), Implications of the Geochemical Behavior of the Copper Rand Deposit on the Dore Lake Shear Belt, *in:* J. Guha and E.H. Chown (eds.), Chibougamau Stratigraphy and Mineralization, Canadian Institute of Mining, Spec. Vol. 34: 300–318.

Arnold M., Guha J. (1980), Aspect isotopique 34S‰ d'un processus de mobilisation et de reconcentration de sulfures en amas à structure filonienne, Mineralium Deposita, V. 15: 361-381.

Baer A.J. (1976), The Grenville Province in Helikian Times: a Possible Model of Evolution: Philosophical Transactions of the Royal Society of London, Series A, V. 289: 499-515.

Bertoni C.H., Vachon A. (1984), The Corner Bay Deposit: A New Discovery in the Dore Lake Complex *in*: J. Guha and E.H. Chown (eds.), Chibougamau Stratigraphy and Mineralization, Canadian Institute of Mining, Spec. Vol. 34: 319-328.

Bureau S. (1980), Zones de brèches associées à des gites de porphyres cuprifères archéens dans la région de Chibougamau: thèse de M.Sc non publiée, Université du Québec à Chicoutimi, 103 p.

Bureau S., Guha J. et Cimon J. (1979), Zones de brèches associées à des prophyres cuprifères archéens dans la région de Chibougamau, Geological Association of Canada/Mineralogical Association of Canada, Program with abs, v.4, p. 41.

Buro Y. (1984), The Geology of the Bachelor Lake Gold Mine, Desmaraisville, Abitibi-East, Quebec, *in*: J. Guha and E.H. Chown (eds.), Chibougamau Stratigraphy and Mineralization, Canadian Institute of Mining, Spec. Vol. 34: 385-392.

Cimon J. (1973) Possibility of an Archean Porphyry Copper in Quebec: Canadian Mining Journal, v. 94: 57.

Cimon J. (1976), Géologie du canton de Queylus (NE), Ministère des Richesses naturelles du Québec, rapport préliminaire DPV 439: 34 p.

Corriveau L. (1982), Physical Conditions of the Regional and the Retrograde Metamorphism in the Pelitic Gneisses of the Chicoutimi Area, Quebec: Unpublished M.Sc. Thesis, Queen's University, 264 p.

Coté D., Woussen G. (1986), Late Mafic Dykes in the Lac Saint-Jean Anorthosite Massif, Geological Association of Canada/Mineralogical Association of Canada meeting, Ottawa 1986, Abs. with program, p. 59.

Dimroth E., Woussen G. and Roy D.W. (1981), Geologic history of the Saguenay Region, Quebec (Central Granulite Terrain of the Grenville Province): a Working Hypothesis, Canadian Journal of Earth Sciences, v. 18: 1506-1522.

Dimroth E., Imreh L., Rocheleau M. and Goulet N. (1982), Evolution of the South-Central Part of the Archean Abitibi Belt, Québec. Part I: Stratigraphy and Paleogeographic Model, Canadian Journal of Earth Sciences, v. 20: 1355-1373.

Dimroth E., Imreh L., Goulet M. and Rocheleau M., (1983)b, Evolution of the South-Central Part of the Abitibi Belt, Québec. Part II: Tectonic Evolution and Geomechanical Model, Canadian Journal of Earth Sciences, v. 20: 1355-1373.

Dimroth E., Imreh L., Goulet M. and Rocheleau M., (1983)b, Evolution of the South-Central Part of the Abitibi Belt, Québec. Part III: Plutonic and Metamorphic Evolution, Canadian Journal of Earth Sciences, v. 20: 1374-1388.

Dimroth E., Rocheleau M. and Mueller W., (1984), Paleogeography, Isostasy and Crustal Evolution of the Archean Abitibi Belt: A Comparison of the Rouyn-Noranda and Chibougamau-Chapais Areas, *in*: J. Guha and E.H. Chown (eds.), Chibougamau Stratigraphy and Mineralization, Canadian Institute of Mining, Spec. Vol. 34: 73-88.

Dimroth E., Rocheleau M., Mueller W., Archer P., Brisson H., Fortin G., Jutras M., Lefebvre C., Piché M., Pilote P. and Simoneau P. (1985), Paleogeographic and Paleotectonic Response to Magmatic Processes: a Case History from the Archean Sequence in the Chibougamau Area, Quebec: Geologische in Rundschau, Bd. 74: 11-32.

Fowler A.E., Doig R. (1983). The Age and Origin of Grenville Province Uraniferous Granites and Pegmatites: Canadian Journal of Earth Sciences, V. 12: 92–104.

Gouvernement du Québec (1984). Le virage technologique: Bâtir le Québec — Phase 2, programme d'action 82–86. Québec, DGPG.

Guha J. (1984). Hydrothermal Systems and Correlation of Mineral Deposits in the Chibougamau Mining District — An Overview. J. Guha and E.H. Chown (eds.), Chibougamau Stratigraphy and Mineralization, Canadian Institute of Mining, Spec. Vol. 34: 517–534.

Guha J., Lange-Brard F., Peloquin S., Racicot D. and Bureau S. (1984). Devlin Deposit, a Part of an Archean Porphyry System. *in*: J. Guha and E.H. Chown (eds.), Chibougamau Stratigraphy and Mineralization, Canadian Institute of Mining, Spec. Vol. 34: 345–356.

Guha J., Archambault G. and Leroy J. (1983). A Correlation between the Evolution of Mineralizing Fluids and the Geochemical Development of a Shear Zone as Illustrated by the Henderson 2 Mine, Quebec: Economic Geology, V. 78: 1605–1618.

Guha J., Leroy J. and Guha D. (1979). Significance of Fluid Phases Associated with Shear Zone Cu-Au Mineralization of the Doré Lake complex, Chibougamau, Québec: Bulletin de Minéralogie, V. 102: 569–576.

Knuckey M.J., Watkins J.J. (1982). The Geology of the Corbet Massive Sulphide Deposit, Noranda District, Quebec, Canada. *in*: R.W. Hutchinson, D.D. Spence and M.J. Franklin (eds.), Precambrian Sulfide Deposits, Geological Association of Canada, Spec. Pap. 25: 297–318.

Knuckey M.J., Combu C.D.A. and Riverin G. (1982) Structure, Metal Zoning and Alteration at the Millenbach Deposit, Noranda, Quebec. *in*: R.W. Hutchinson, D.D. Spence and M.J. Franklin (eds.), Precambrian Sulfide Deposits. Geological Association of Canada Spec. Pap. 25: 255–296.

Lapointe B. (1984). Les relations structurales autour du lobe anorthositique de Saint-Fulgence, Thèse de M.Sc., Université du Québec à Chicoutimi, 142 p.

MacLean W.H. (1984). Geology and Ore Deposits of the Matagami District. *in*: J. Guha and E.H. Chown (eds.), Chibougamau Stratigraphy and Mineralization, Canadian Institute of Mining, Spec. Vol. 34: 483–495.

Pilote P., Guha J., Dimroth E., Tremblay A. and Gobeil A. (1984). Stratigraphic Positions of Mineralized Occurrences in the Mont Bourbeau and Lac Berrigan regions, and their Significance. *in*: J. Guha and E.H. Chown (eds.), Chibougamau Stratigraphy and Mineralization, Canadian Institute of Mining, Spec. Vol. 34: 288–299.

Racicot D., Chown E.H. and Hanel T. (1984). Plutons of the Chibougamau-Desmaraisville Belt; a Preliminary Survey. *in*: J. Guha and E.H. Chown (eds.), Chibougamau Stratigraphy and Mineralization, Canadian Institute of Mining, Spec. Vol. 34: 178–197.

Rivers T., Chown E.H. (1986). A Geological Compilation of Paraautochtonous Aphebian Sequence in the Grenville Province of Western Labrador-Eastern Quebec. *in*: J.M. Moore, A. Davidson and A.J. Baer (eds.), New Perspectives on the Grenville Province, Geological Association of Canada, Spec. Paper 31, (sous presse).

Rogers D.S. (1982) Canadian Institute of Mining, Spec. Vol. 24: 161–170.

Roy D.W., Woussen G., Dimroth E. and Chown E.H. (1986) The Central Grenville Province: a Zone of Protracted Mantle and Crustal Processes. *in*: J.M. Moore, A. Davidson and A.J. Baer (eds.), New Perspectives on the Grenville Province, Geological Association of Canada Spec. Paper 31, (sous presse).

Salmon B., Coulombe A. and Ouellet A.J. (1984) Structure, Mineral Distribution and Wall Rock Alteration of the No 7 Vein, Opemiska Copper Mine, *in*: J. Guha and E.H. Chown (eds.), Chibougamau Stratigraphy and Mineralization, Canadian Institute of Mining, Spec. Vol. 34: 357–369.

Sethuraman K. (1984) Discovery of an Archean Volcanogenic Environment in the Grenville Structural Province, *in*: J. Guha and E.H. Chown (eds.), Chibougamau Stratigraphy and Mineralization, Canadian Institute of Mining, Spec. Vol. 34: 473–482.

Spence C.D., Spence A.F. (1985) The Place of Sulfide Deposits at Noranda, Québec, Economic Geology, V. 70: 90–101.

Thorpe R.I., Guha J., Franklin J.M. and Loveridge W.D. (1984), Use of a Superior Province Isotope Framework in Interpreting Mineralization Stages in the Chibougamau District, *in*: J. Guha and E.H. Chown (eds.), Chibougamau Stratigraphy and Mineralization, Canadian Institute of Mining, Spec. Vol. 34: 496–516.

Tremblay G. (1985), Études des déformations du métaquarzite de La Qualette, comté de Charlevoix: thèse de maîtrise, Université du Québec à Chicoutimi, 147 p.

Walker S.D., Gregheur P. (1982), Canadian Institute of Mining, Spec. Vol. 24: 58–68.

Woussen G., Dimroth E., Corriveau L. and Archer. P. (1981) Crystallization and Emplacement of the Lac Saint-Jean Anorthosite Massif, Quebec, Canada: Contributions to Mineralogy and Petrology, V. 76: 343–350.

Woussen G., Roy D.W., Dimroth E. and Chown E.H. (1986), Mid-Proterozoic Extensionnal Tectonics in the Core Zone of the Grenville Province, *in*: J.M. Moore, A. Davidson and A.J. Baer (eds.), New Perspectives on the Grenville Province, Geological Association Spec. Paper 31, (sous presse).

Woussen G., Brard F., Martignole J. and Nantel S. (soumis) The Saint-Henri de Taillon Segment of the Lac Saint-Jean Anorthosite Massif (Grenville Province, Canada): a Relic of a Layered Complex. Contributions to Mineralogy and Petrology.

Wynne-Edwards, H.R. (1972), The Grenville Province, *in*: R.A. Price and R.J.W. Douglas (eds.), Tectonic Styles in Canada: Geological Association of Canada, Spec. Paper 11: 263–334.

Université du Québec à Chicoutimi

REMOTE SENSING FOR PLANT RESOURCES MANAGEMENT: A CASE STUDY IN LAC-SAINT-JEAN, QUEBEC, CANADA

Gilles-H. Lemieux

In association with

René Verreault[2], Suzie Perron[1], Gilles Vachon[2] and Martin Labonté[1],
Remote Sensing Laboratory[1] and Atmospheric Physics Laboratory[2]
Université du Québec à Chicoutimi

Abstract: Plant resources management of the boreal agri-forestry regions of Quebec, Canada, is among the many applications of remote sensing.

Since temperature is the main factor limiting the natural environment suitable for growing small wild fruits (especially blueberries) and commercial forests (especially black spruce) in the Lac-Saint-Jean area of Quebec, studying the surface dynamics of air masses is essential in determining the source, location and intensity of overnight frosts during the growing season. Adequate cartography of the topoclimatic dynamics related to this peculiar agri-forestry environment can help in locating and choosing proper actions to regularize night frost and substantially increase biological productivity.

Supported by data recorded from traditional hygrothermographic ground stations and other terrain observations, thermographic, multispectral and anemographic remote sensing techniques assisted by digital analysis cartography can determine efficiently the microclimatic variations associated with specific environmental features such as hydrology, topography, geomorphology, land use and meteorology around and within the exploited areas.

Moreover, the microclimate of these areas can be appreciably modified by some indirect and direct actions against frost hazards by field sprinkling, tree cutting, air draining, bush mowing or hedge clearing. However, in order to be economical, these actions should take advantage of the topography and the global geographical setting of the intervention sites.

Résumé: La gestion des ressources végétales des régions agro-forestières du Québec, Canada, est une des applications nombreuses de la télédétection.

Comme la température est le principal facteur limitant la capacité de l'environnement naturel à produire des petits fruits sauvages (principalement le bleuet) et des forêts commerciales (en particulier l'épinette noire) dans la région du Lac-Saint-Jean au Québec, l'étude de la dynamique des masses d'air est essentielle pour déterminer l'origine, l'étendue et l'intensité des gelées nocturnes pendant la saison de croissance. La cartographie détaillée de la

dynamique topoclimatique reliée à ce type d'environnement agro-forestier peut servir à localiser et à choisir les correctifs propres à régulariser le gel radiatif et ainsi augmenter substantiellement la productivité biologique.

S'appuyant sur les données traditionnelles de stations hygrothermographiques au sol et d'autres observations de terrain, les techniques de la télédétection thermographique, multispectrale et anémographique assistées de la cartographie numérique peuvent déterminer efficacement les variations microclimatiques associées à des traits spécifiques de l'environnement notamment l'hydrologie, la topographie, la géomorphologie, l'utilisation du sol et la météorologie autour et à l'intérieur des zones d'exploitation.

De plus, le microclimat de ces zones peut être sensiblement modifié par certaines actions directes et indirectes contre les dangers de gel par l'arrosage des secteurs gélifs, la coupe des arbres de barrière, la drainage de l'air froid, l'abattage des bosquets et la modification de l'orientation des haies. Cependant, afin d'être économiques, ces actions doivent s'accomoder de la topographie et de la disposition géographique globale des sites d'intervention.

Introduction

In the past fifteen years, remote sensing techniques have become a very sophisticated tool permitting geographers and planners to develop their own methodology with regard to very specific needs. The variety of sensors, platforms and computer programmes is so large that most inventories for land management can call upon remote sensing technology: multi-spectral, multi-stage and multi-date coverages being all possible. Vegetative resources management of the boreal agri-forestry regions of Quebec, Canada, is among the many applications of remote sensing.

The present study deals with the case of commercial blueberry production of the Lac Saint-Jean region. Since temperature is the main factor limiting the natural environment of the organized blueberry fields, studying the surface dynamics of air masses is essential in determining the source, location and intensity of overnight frosts during the growing season. Over a period of four years, the St. Nazaire blueberry fields were chosen as an experimental site, as much for the particular application of thermographic as for the development of anemographic remote sensing tools. These blueberry fields have also become a test area for the application of a corrective measures programme against frost hazard (Lemieux et al., 1983a, 1983b).

Since lowbush wild blueberry (Ericacea family, *Vaccinium* species) is adapted to a well drained terrain or a dry station, most commercial blueberry fields were established on permeable deltaic sand deposits of horizontal or slightly undulating topography. However, the general flatness of the extensive geometric terrains, which were deforested to facilitate open blueberry-growing areas, have often created frost prone-areas during the characteristic nights of thermic inversion. Moreover, the diurnal overheating of the sandy soil accentuates the desertic character of their microclimate.

This spatial understanding is gained by: (1) photo interpretation of the drainage, topographic gradient, land use, vegetation and geomorphology of the perimeter and interior of the growing areas; (2) thermic mapping, using digital processing, to determine the

Figure 1. Physiography of St. Nazaire blueberry fields.

probability zones for extreme, moderate and light frosts, and correlation of these zones with the above parametres; (3) thematic mapping in the form of new types of integrated management of the growing area using correlated data on the drainage, geomorphology, vegetation and thermal and land use characteristics of the blueberry fields and (4) anemometric ground observation and anemometric mapping (anemography) corroborating the horizontal and static thermography of the area by permitting simultaneous measurements of air masses dynamics by means of a catadioptric wind vane network.

Geographic parameters

The St. Nazaire blueberry fields cover 600 hectares settled on 30 metres or so of deltaic sand deposits (figure 1). The terrain surface shows a sandy plain randomly accentuated with many aeolian dunes of no more than three metres high. Many dry kettles or kettle lakes complete the geomorphological landscape.

Around the deforested blueberry-growing block, striped by many remaining parallel tree hedges, lies a coniferous forest of variable density beyond which grows a huge string-peat-bog on the south side. The Peribonca River, carved within its own delta, borders the north side of the blueberry fields, but it has no influence whatever on the topographic gradient of the fields which dips imperceptibly to the south from 185 to 178 metres of altitude (figure 1). This slight topographic gradient accounts for the catabatic flow of stratified air layers above the ground in a north-south direction notwithstanding a different circulation of regional air masses flowing down the "High Laurentides" mountains to the plain.

Other characteristics concerning the blueberry fields belong to human intervention through agricultural practices such as burning and mowing the fields in rotation according to a three to four years cycle.

Methodology

A) Thermography

The aerial thermographic data have been obtained with a DAEDALUS sensor (1260) of the Canada Centre for Remote Sensing (CCRS), EMR, Ottawa. Flights were performed during typical nights of thermic inversion, characterized by the absence of cloud, wind and recent rain for the following dates: September 7, 1982, October 21, 1983 and June 7, 1985. The scanner has registered the emission levels within the 8 to 14 μ thermic window of the electromagnetic spectrum. A same altitude of 7260 m above the ground has permitted a similar terrain coverage for the three flight missions. At this altitude the pixel represents a ground truth surface of 15.7 m by 15.7 m, simulating 28,000 thermometers measuring simultaneously ground temperature within a range of 256 possible levels (one byte per pixel). Control field measurements were carried out on every flight in order to calibrate the data furnished by the sensor. Significant observations of superficial temperature of certain objects (blueberry plants, bare ground, water surface, forest undergrowth, etc.) and variable temperature of the stratified layers of air, were also registered on the spot by means of alcohol thermometers, small sensitive wind vanes, and smoke canisters.

The numerical data have been analysed on SCANIQ (Système Conjoint d'Analyse Numérique des Images du Québec) at CCQT, MER, Quebec City. The most important digital analysis had to do with the training zones, the pixel dumps, the characterization of spectral signatures, the thematic classification, and the edition of computerized color maps. The major physiographic and agronomic features susceptible of influencing the thermic variations of the blueberry fields were mapped from the false infrared air photographs and from field observations.

As a preliminary approach, simple correlations performed between the 1982 and 1983 thermographies and the physiographic features of the blueberry fields have permitted the thermic zoning, the localisation of intervention measures and the type of fight against the radiant frost affecting the blueberry production during the growing season (figure 6). These observations have been realized by superimposing the digital and analogical maps on a backlit table. (Lemieux et al., 1984a, 1984b).

The third flight of June 1985 showing the changes brought to the microclimate of the blueberry fields after the management project carried out during the summer of 1984, completes the chronosequence and provides new elements for discussion.

B) Anemometry versus anemography

Knowing the cold air currents pattern within the limit of the blueberry fields, constitutes a very important element to explain the localisation of frost prone-areas. The first measurements have been worked out in 1983 in the south-west sector of the exploitation. Two towers at 200 m intervals were set up to measure wind direction and velocity from the ground up to 8 m. In addition, highly sensitive wind vanes installed every 50 m between the two towers indicated wind direction at 50 cm from the ground.

Following the interventions carried out during the summer of 1984, new anemometric techniques were implemented in 1985 in order to measure simultaneously the air circulation over a large surface. Conventional towers would have been costly and prohibitive. Special wind vanes equipped with lateral deflecting flaps were installed. The orientation of the wind vanes indicated wind direction whereas the counterbalancing position of the spring-loaded flaps registered the velocity (figure 2).

This anemometric sensor (wind vane) is also equipped with four reflective screens oriented upward. Photographed at night by means of an airborne array of strobe lights, the wind vanes can indicate the direction and velocity of cold air flow from the position of the catadioptric transducers (Verreault et al., 1985). Twenty seven of these sensors were installed at 200 m intervals in the southwest corner of the blueberry fields forming a network 1,2 km long (east-west) by 0,8 km wide (north-south).

A light aircraft (Piper Warrior II) equipped with the strobe lights totalling 20 000 cd-s, can fly according to a pre-established flight line with a precision of + or −50 m by means of a radio-information LORAN-C system.

More than sixty photographs on highly sensitive 35 mm colour film (boosted at 3 200 ASA) were interpreted from various flights carried out during specific frost hazard nights. An anemographic map showing the mean air flow velocity and direction was created.

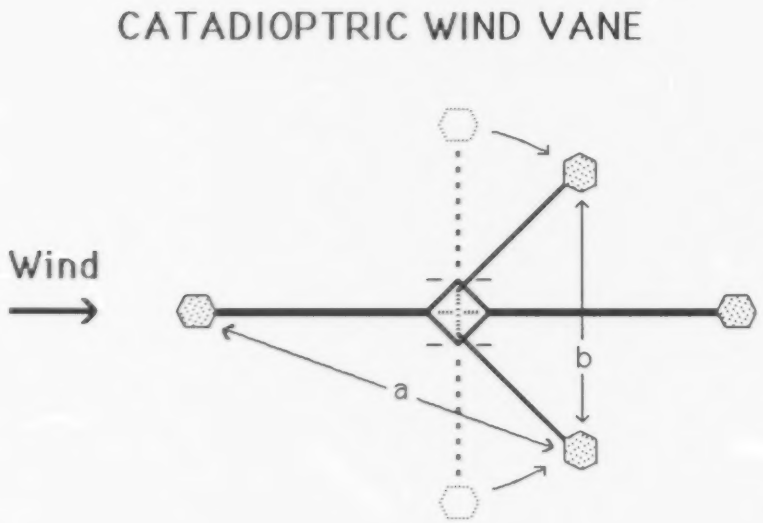


Figure 2. Schema of the anemometric sensor principle.

First results

A) Thermography

Figures 3 and 4 represent night thermographies of the St. Nazaire blueberry fields for the flights of 1982 and 1983 respectively.

Digital image analysis of 1982 and 1983 has permitted the study of the thermic behaviour of the blueberry fields in function with the geographic parametres. The outstanding results of this analysis demonstrate that: (1) the extreme temperature classes are highly correlated with the topographic elements of the blueberry fields, either the warm classes with sand dunes and hillocks or the cold classes with the cold air retention hollows, the dry kettles, the closed depressions and the thick-tree hedges and (2) the intermediate temperature classes on either side of the mean, are related to the agronomic structures and rotation patterns of the fields (especially springtime burnings).

Anemometric ground observations were added to these first interpretations for a better understanding of the frost hazard phenomenon in order to plan proper actions aimed at draining the cold air pockets.

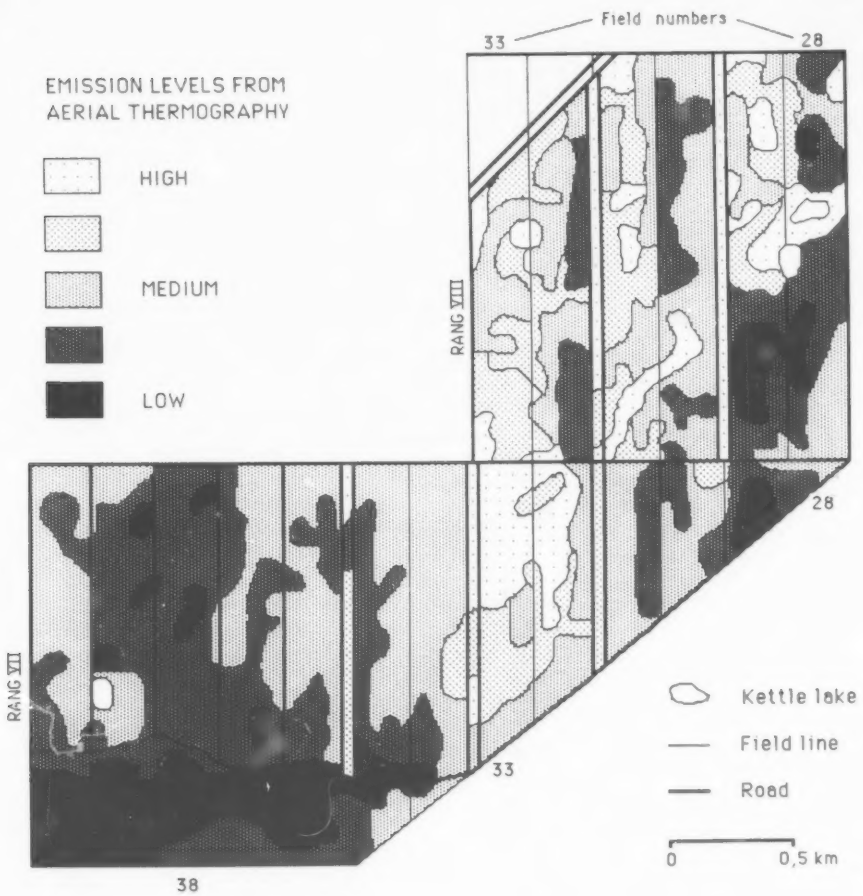


Figure 3. Thermography of September 7, 1982.

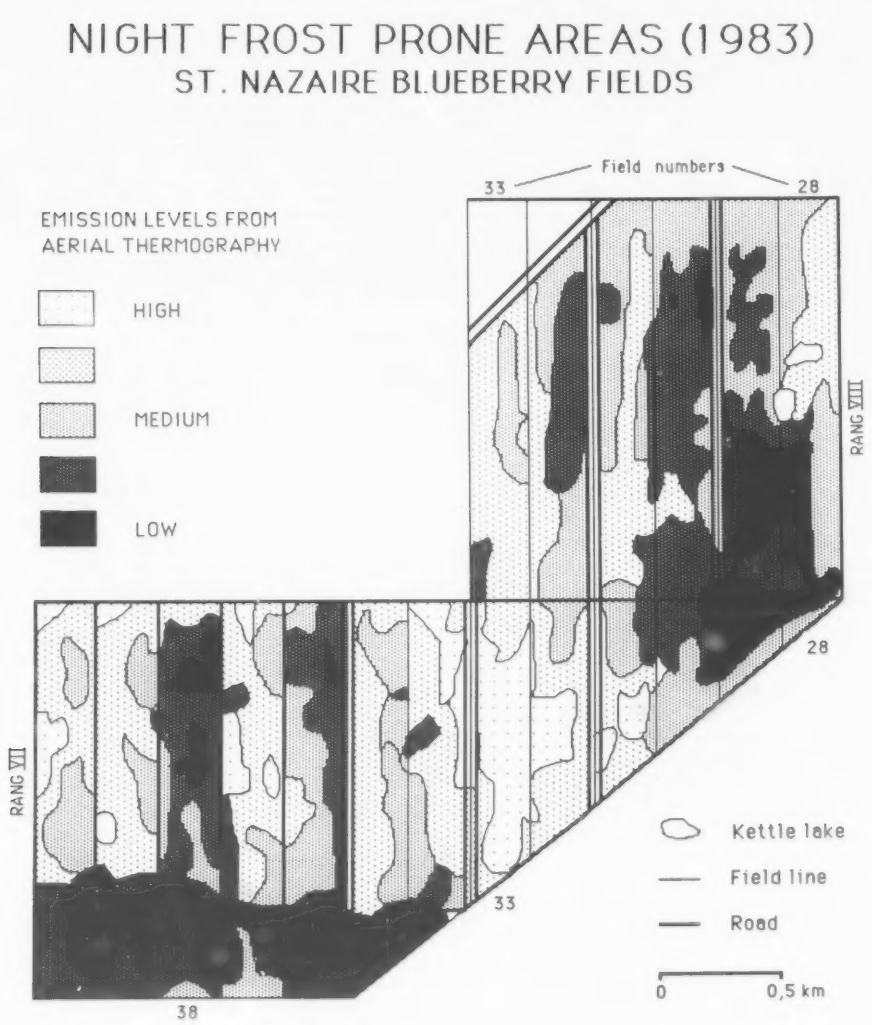


Figure 4. Thermography of October 21, 1983.

B) Anemometry

Various nighttime anemometric measurements were carried out during the summer of 1983 in the southwest corner of the blueberry fields. At 8 m above the ground, the wind corresponded to a catabatic air flow coming from the mountains situated at 10 km to the northeast of the study area (figure 4 and 5).

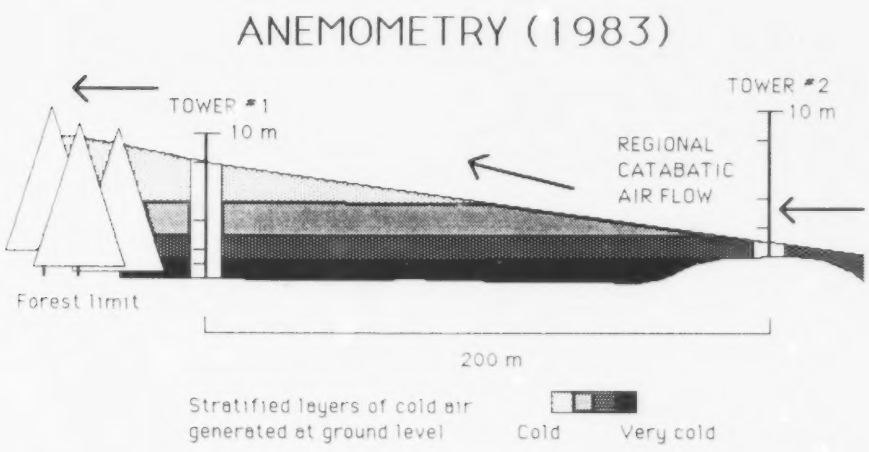


Figure 5. Stratified air wedge in the blueberry fields southwest corner.

However, at levels of 50 cm and 1 m, very light and variable winds have been observed, indicating that no well organized system exists in the area. On a particular night, the setting of a thick fog has permitted the visualisation of a stratified air wedge driven back to the forest limit by the northeast air circulation (figure 5).

The very light air currents in the cold part of the blueberry fields were proven to be completely independent of the main flow of air which was rising up over the dense air wedge and above the forest top.

A plan of integrated actions against frost was proposed (figure 6) with indirect and direct interventions as follows: Forest cutting of zone C would favour, by indirect action, the establishment of two air drainage breaches of zone A3, provocating at the same time the recuperation of zone B2 for blueberry growing. Zone B1, being a cold air retention hollow without any drainage possibility, could be recuperated by field sprinkling, the water supply being readily available at proximity in Zone D.

Other actions, such as tree hedge clearing in strategic areas and bush mowing, could help in diminishing the loss caused by frost hazard by accentuating the catabatic air circulation above the ground. A new management system of the fields, such as smaller plots or checkerboard patterns of rotation, would certainly increase the productivity.

Intervention

The determinant action of the integrated intervention plan against frost was the deforestation of the south sector of the blueberry fields for the air drainage of the zones A3 and B2. The operation was undertaken during the summer of 1984. Two corridors have reached the open peat-bog area, one in a north-east/south-west axis and the other in a north-south direction (figure 6). However, the enterprise ran out of time and the cleaning of the undergrowth and the collection of the abatis could not be completed before the new thermographic flight mission. A sprinkling system was equally tested in zone B1.

Following these corrective actions, a third thermographic flight permitted, using the same methodology, the modification of the blueberry fields microclimate to be verified.

Last results

A) Thermography

Comparative study of the three thermographic analyses shows a clear similarity from the results of the years 1982 and 1983 (figures 3 and 4). The frost-prone areas are perceptibly localized at the same places with or without the influence of burning and fields rotation.

However, a complete rupture of the temperature classes is clearly noticeable on the 1985 thermic image (figure 7) which was digitized after the management operation of 1984. The opening of air drainage breaches produces the air stratification which transposes itself directly on the altimetry of the blueberry fields, the gradation from warm to cold corresponding to the subsidence from 185 m to 180 m in a north-south direction. This new thermography suggests the positive effect of the deforested corridors acting on the blueberry fields as an air discharge by reducing the thickness of the cold air layer above the ground.

B) Anemography

This argument on the evacuation of cold air is supported by the observation near the ground of an external catabatic wind coming from the northeast and contributing to the draining off of the air masses toward the forest breaches. Moreover, various anemographic remote sensing flights during the fall of 1985 have confirmed these phenomena inferred from the thermography and the ground truth measurements.

Effectively, with reference to figure 8, three different systems of ground circulation can be recognized:

(1) the large arrow, showing the direction of the regional catabatic wind, summarizes many observations done with smoke canisters which demonstrated that the air flow is generally sweeping the whole northeast and central parts of the blueberry fields, the exception

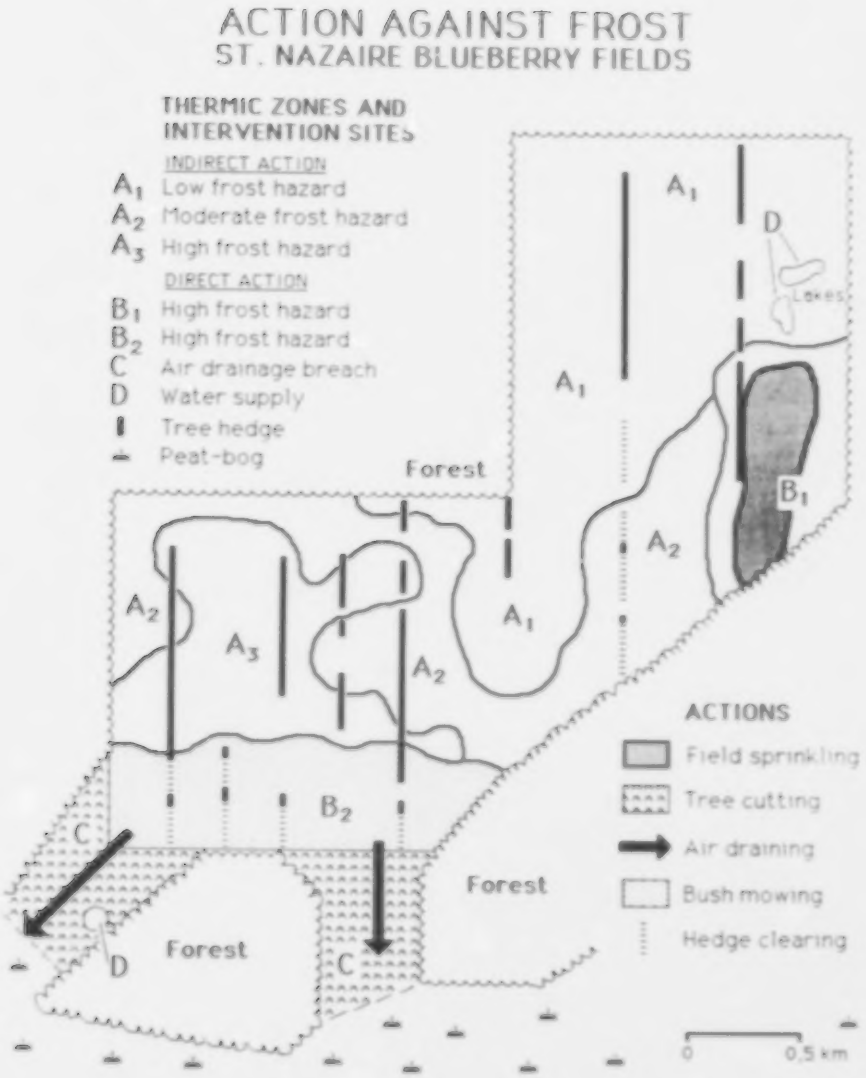


Figure 6. Plan of action for the St. Nazaire blueberry fields frost hazard.

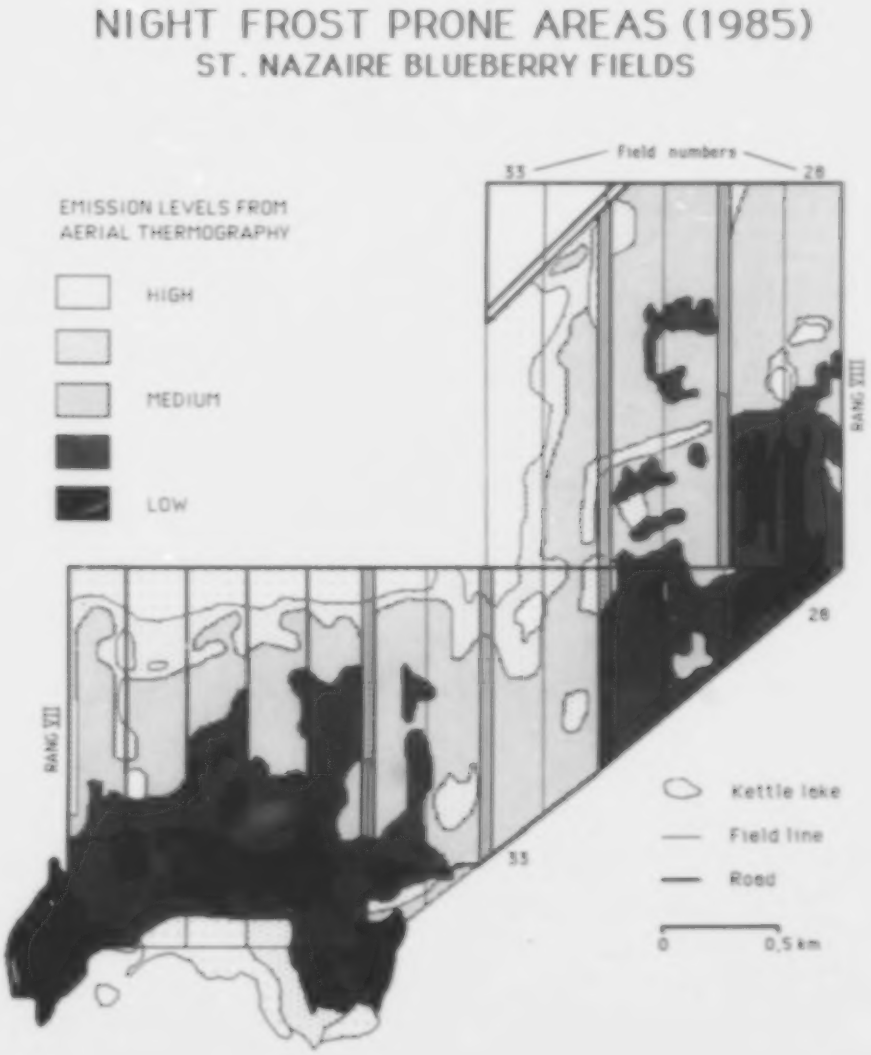


Figure 7. Thermography of June 7, 1985.

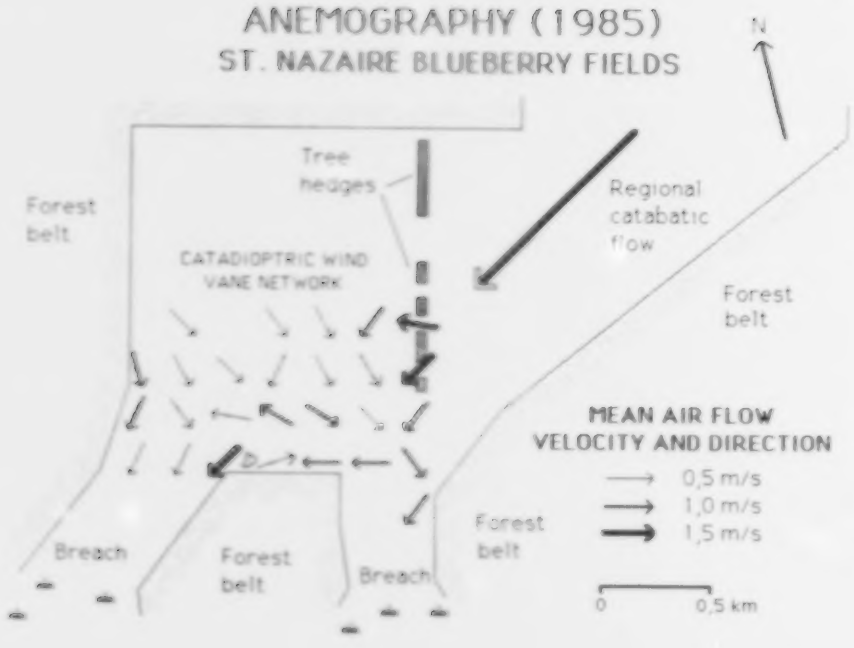


Figure 8. Air flow pattern of St. Nazaire blueberry fields at ground level during the night of October 31, 1985.

being the retention hollow in the southeast part of the exploitation (see thermographies); (2) the top rows of the catadioptric wind vane network (short arrows) display a uniform pattern of ground wind coming from a north-north-west direction. This wind seems to be fed by the general catabatic air flow which gets deflected by the northwest forest belt and is folded back at a different angle; (3) the bottom rows of the catadioptric wind vane network reveal the junction of the two preceding air flows which leave the blueberry fields through the breaches toward a lower, open peat-bog. Between the two air drainage breaches, a small zone of disorganized circulation corresponds to the whirlwinds generated by the mixture of the two air flows and the bouncing effect of the forest belt wall; and (4) the mean air flow velocity was next to 0.5 m/s save for a few sites on the east side of the network where some wind vanes indicated an acceleration of the air flow due to the proximity of some tree hedge openings.

In brief, there is a general north-south component of ground circulation for the entire blueberry fields which contrasts with the situation previous to the breaches clearing, where a thick and stagnant air mass covered the ground in the southwest part of the fields and aggravated the frost hazard conditions.

Discussion

In the light of these analyses, the pertinency of the corrective measures and actions against the phenomenon of radiative frost affecting the blueberry fields can be evaluated. These interventions produce a complementary understanding of the air masses dynamics which play an important role in the frost hazard.

In the manner of the cut-overs, the young forest sectors denote a certain thermic variation. The more pronounced slopes indicate a relatively warm temperature (1) whereas the valley bottoms (K and L) are associated with cold temperatures due to the stagnation of cold air drained down from the surrounding hillside. These young forests are also susceptible to attack by frost within the terrain depressions.

Moreover, thermography can easily help to differentiate the marshy and humid zones marked by low temperatures (1, 2 and 4) and the dry soils such as gravel pits and dirt roads which are associated with high temperatures (3).

This cartography of frost-prone areas — superimposed to the actual forest land use map (logging inventory and topography) — can lead to some economic actions against the retarding effects of radiant frost on the forest regrowth. Some of these actions would consist of air drainage breaches into the residual forest strips along lakes and rivers or the levelling of some obstacles, such as abatis, responsible for air stagnation at ground level. Other recommendations would aim at the reforestation programmes in permitting an optimal localisation of certain species to avoid frost hazards or fungus infestations.

Conclusions

The blueberry-growing zone of St. Nazaire and some DONOHUE forest operation sectors of Lac-Saint-Jean, Quebec, serve as a model for determining the zoning, harvesting and deforestation conditions that optimally counter the effects of frost. Remote sensing is therefore a modern tool for analysing the frost problem and for developing suitable conditions.

Figure 9a. Land use of Lac Saint-Jean forest.

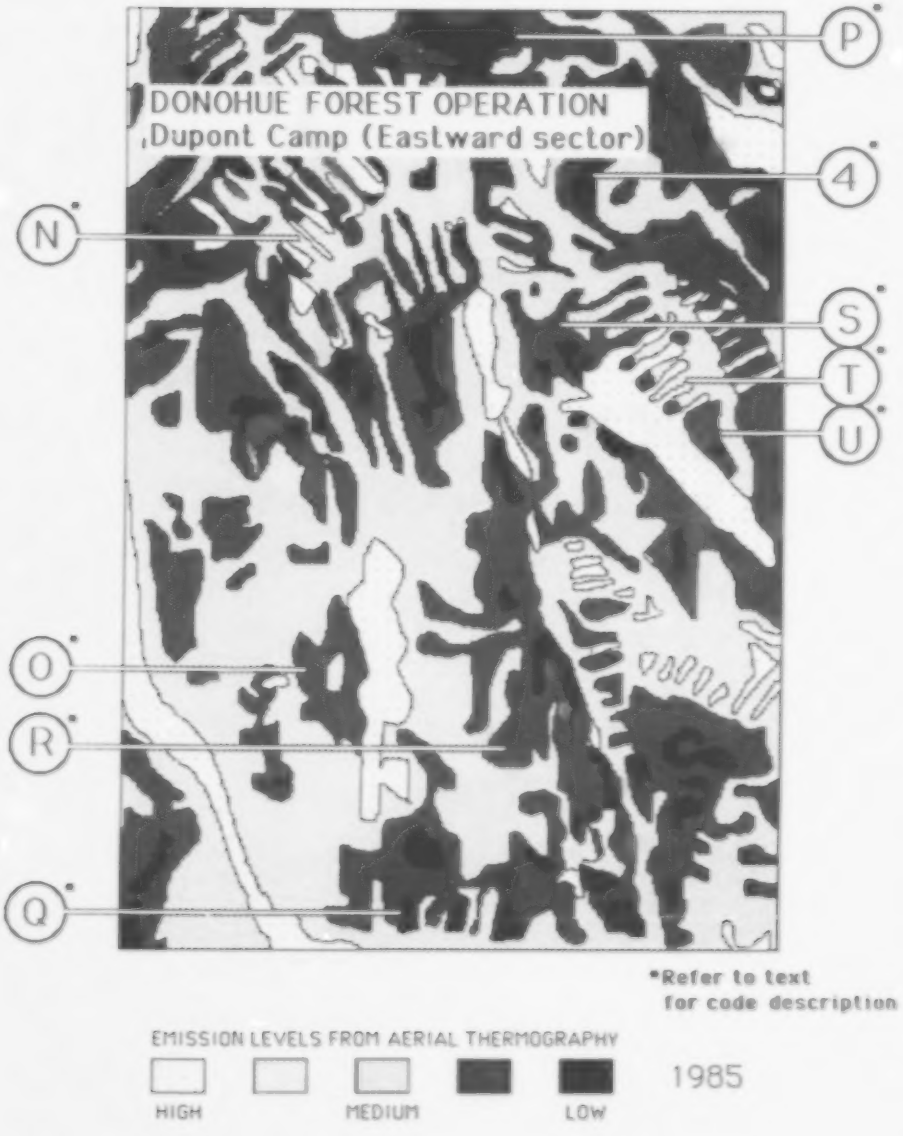


Figure 9b. Thermography of June 7, 1985.

Figure 10a. Land use of Lac Saint-Jean forest.

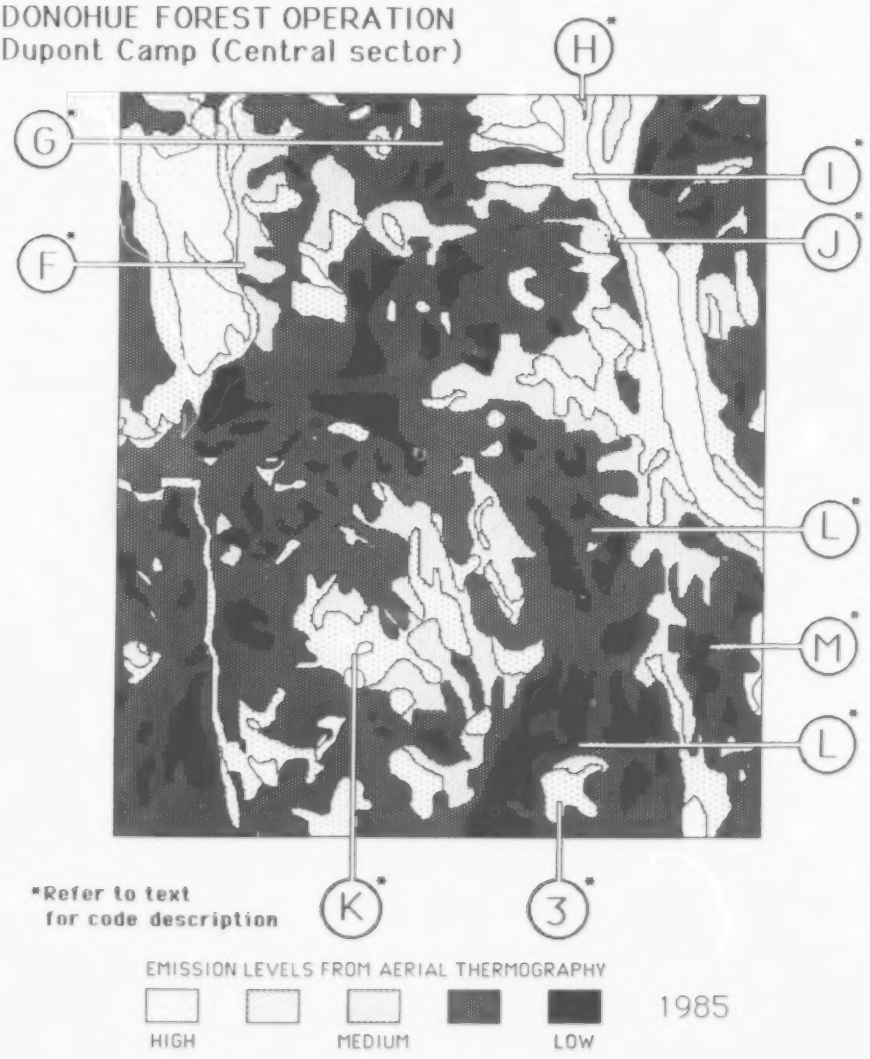


Figure 10b. Thermography of June 7, 1985.

Figure 11a. Land use of Lac Saint-Jean forest.

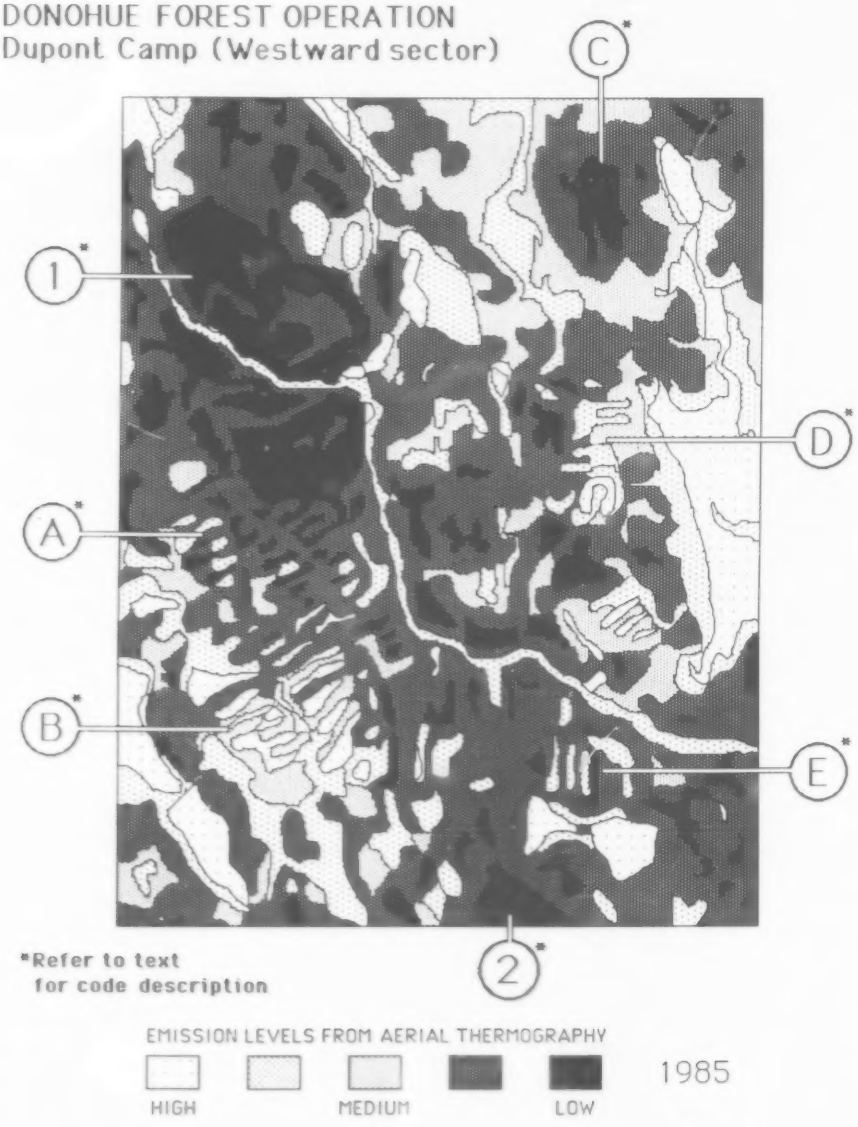


Figure 11b. Thermography of June 7, 1985.

Université du Québec à Chicoutimi

Multidate thermography and chronosequential analysis permit the cartography of an "evolutive" situation related to the frost hazard behaviour of a peculiar agri-forestry environment of northern Quebec.

Additional anemometric data obtained by aerial night photography, using a network of catabatic wind vanes on the ground, lead to highly informative maps of frost-prone areas derived from the thermography. By reference, the temperature differences of objects reveal certain laminar characteristics of the ground thermic inversions and the location of specific still, or flowing, air masses in relation to topographic features. The wind vanes, equipped with catadioptric transducers and photographed by means of an airborne array of strobe lights, indicate the direction and velocity of cold air flow as a function of the meso-regional wind, the orientation of the geomorphological features, and the agri-forestry exploitation structures.

Therefore, since microclimate is an essential parameter associated with the natural and man-made growing condtions of the boreal agri-forestry regions of northern Quebec, modern remote sensing techniques such as aerial thermography and anemography, and computer processed data, constitute an important tool for geographers interested in the development of a global resources and land management system and in the rational use and integrated development of renewable natural resources.

References

Cochran, P.H. (1969) "Thermal Properties and Surface Temperatures of Seedbeds", Pacific Northwest Forest and Range Experiment Station, U.S. Department of Agricultural Forest Service, Portland, Oregon, 1969, 19 p.

Dorworth C.E. (1973) "Epiphytology of Scleroderris Lagerbergii in a Kettle Frost Pocket", Department of the Environment, Canadian Forestry Service, Great Lakes Forest Research Centre, Sault-Sainte-Marie, Ont. in European Journal Forest Path, No. 3, Berlin (1973) pp. 232-242.

Duffy, P.J.B. & J.W. Fraser (1963) "Local Occurrences in Eastern Ontario Woodlands", Department of Forestry Publication No. 1029, Forest Research Branch, Ottawa, 24 p.

Geiger, R. (1965) The Climate Near the Ground. Harvard University Press, 2nd Edition, Cambridge, Mass., 611 p.

MESURES DE GIVRAGE SUR UN CÂBLE AU MONT VALIN

Pierre McComber, Jacques Druez et Yvon Lavoie
Université du Québec à Chicoutimi

Résumé: Les auteurs ont instrumenté un câble sur le sommet du Mont Valin (alt. 902 m) afin de quantifier le givrage atmosphérique, et ils ont mesuré la tension à l'extrémité du

câble, la température, la vitesse et la direction du vent. Ils analysent l'augmentation dans le temps de la charge de glace du câble pour les événements de givrage les plus importants de la saison 1984–1985. Les résultats indiquent que les charges dues à la glace ont tendance à augmenter de façon exponentielle avec le temps. Ce comportement est différent de celui prédit par certains modèles récents de givrage des câbles. Cette différence peut toutefois s'expliquer par le fait que le coefficient de captation calculé à partir d'une surface cylindrique lisse est inferieur au coefficient de captation réel d'un câble givré. La rugosité superficielle d'un câble givré apparaît comme la principale cause de cette différence entre les coefficients de captation calculés et mesurés.

Abstract: The authors instrumented a cable at the top of Mont Valin, Quebec (902m) with a view to quantifying atmospheric icing. They measured tension at the end of the cable, temperature and wind speed and direction. They analyzed the increase, through time, of the ice load for the main riming events of the 1984–85 season. The results show that loading due to ice tended to increase exponentially with time. This is different from the behaviour predicted by certain recent models of cable riming. The diffference may be explained by the fact that the collection efficiency coefficient, calculated from a smooth cylindrical surface, is lower than the true collection efficiency coefficient of an iced cable. The surface roughness of an iced cable appears to be the principal source for the difference between the calculated and measured collection efficiency coefficients.

1. Introduction

Le givrage atmosphérique des superstructures est un facteur important dans la conception des lignes de transport de l'électricité dans les régions nordiques. La complexité du processus de givrage et la rareté des données expérimentales sur celui-ci rendent difficile le calcul réaliste des charges de glace aux fins de la conception (Brown et Krishnasamy, 1984). Des modèles d'accrétion de la glace ont été récemment élaborés (Makkonen, 1984) afin de prendre en considération les caractéristiques propres au givrage des câbles. Une des différences importantes entre le givrage des câbles et celui des superstructures fixes est la torsion du câble sous le poids de la glace (McComber, 1984; Smith et Baker, 1983; Egelhofer et coll., 1984). Cependant, d'autres facteurs qui jouent un rôle important ne sont pas encore intégrés dans les modèles, par exemple la géométrie du câble (la portée, la flèche, la hauteur du sol), les vibrations induites par le vent, le champ électrique et l'échauffement du conducteur (Nikiforov, 1983). Il faudra recueillir des données supplémentaires avant de pouvoir élaborer et tester un modèle réaliste de givrage. Cependant des données partielles devraient suffire à mettre au point des modèles empiriques, qui pourront par la suite être améliorés.

Dans ce rapport nous utilisons des mesures de charge de glace d'un câble obtenues au Mont Valin au cours de l'hiver 1984–85, afin de vérifier un modèle simple de givrage. De plus, nous comparons la relation qui existe entre la charge et le temps au cours du givrage avec les données prédites par d'autres modèles.

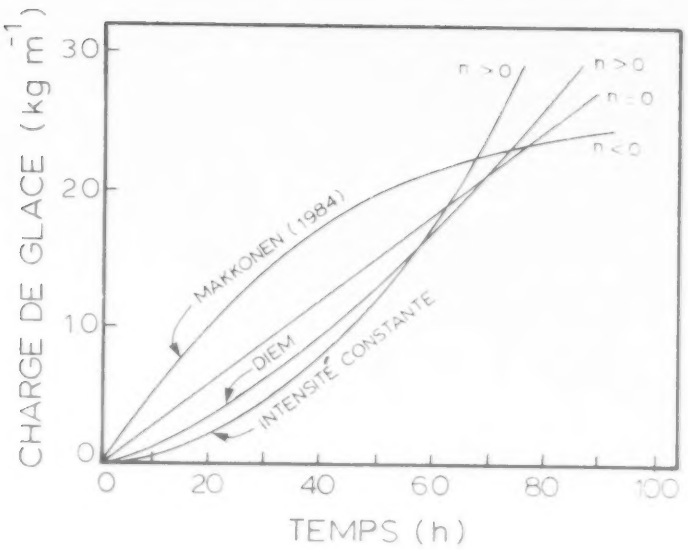


Figure 1: Croissance approximative de la charge de glace sur un câble de 0,5 cm, telle que prédite par différents modèles (V_n = 10 m/s; w = 0,2 g/m^3; d = 20 mm; ρ_i = 0,6 g/m^3; t_a = −5°C; E_0 = 0,1 pour les modèles à E constant). (D'après Makkonen, 1984)

2. Analyse théorique

L'intensité de givrage I (kg/m^2 · h) d'un câble se calcule grâce à la relation suivante (Makkonen, 1984):

$$I = 3{,}6\ E\ w\ V_n \qquad (1)$$

Dans cette équation, E est le coefficient de captation nette, w en g/m^3 est la teneur de l'air en eau liquide, et V_n en m/s est la vitesse du vent dans une direction normale au câble. Le facteur 3,6 est nécessaire pour assurer l'homogénéité des unités dans l'Équ. (1).

Pour calculer la charge de glace en fonction du temps, on doit intégrer l'équation suivante:

$$\frac{dM}{dt} = I\ A \qquad (2)$$

où M est la charge de glace par unité de longueur (kg/m), t est le temps (h), et A est la section par unité de longueur m^2/m, dans une direction normale à la direction de l'écoulement. Pour une forme cylindrique et lisse, la section par unité de longueur devient le diamètre D. Cependant, pour des formes plus générales, la section par unité de longueur peut être considérée comme un diamètre caractéristique de l'accrétion.

Au cours du givrage la charge augmente et, si on néglige le fait que des morceaux de glace peuvent se briser sous l'effet du vent, on doit avoir nécessairement un taux de givrage positif:

$$dM/dt > 0 \text{ et } dD/dt > 0 \tag{3}$$

Dans le cas de la variation du taux de givrage d^2M/dt^2, la tendance est moins simple. Certains modèles prédisent une augmentation du taux de givrage ($d^2M/dt^2 > 0$), mais d'autres une diminution du taux de givrage ($d^2M/dt^2 < 0$). Makkonen (1984) a fait l'analyse de quelques modèles utilisés pour les événements de givrage. Une des différences importantes de ces modèles, illustrée à la Fig. 1, est cette variation du taux de givrage dans le temps. Comme on obtient les charges de glace par intégration de ce taux de givrage, cette variation est critique pour obtenir une simulation réaliste. Il est important pour la sécurité d'une ligne que le modèle ne sous-estime pas la charge totale au bout d'un certain temps.

Le modèle proposé par Makkonen (1984) donne un taux de givrage décroissant dans le temps ($d^2M/dt^2 < 0$). Ceci résulte en une courbe convexe illustrée par la Fig. 1. Le facteur principal qui cause la diminution du taux de givrage est le calcul mathématique du coefficient de captation. Ce calcul, basé sur une forme parfaitement cylindrique et lisse, prévoit une diminution de la captation quand le diamètre augmente (Langmuir et Blodgett, 1946). Ces calculs compliqués peuvent être effectués par approximation grâce à des formules qui ont été proposées par Horjen (1983) et les expressions qu'il recommande ont été utilisées plus loin pour les valeurs calculées de la captation.

Même si la forme la plus simple de modèle est un taux de givrage constant ($dM^2/dt^2 = 0$), ce modèle simple ne semble pas avoir été recommandé dans la littérature scientifique.

Par contre, quelques modèles ont utilisé un taux de givrage croissant ($dM^2/dt^2 > 0$). Parmi ceux-ci le plus connu est probablement celui de Chaîné et Skeates (1974), qui utilisait une intensité constante de givrage:

$$\frac{dM}{dt} = I_0 D \tag{5}$$

Le seul modèle empirique qui apparaît sur la Fig. 1 est celui de Diem (1956). C'est un modèle avec augmentation du taux de givrage, qui correspond à l'expression $M = I_0 t^{1.4}$

3. Le modèle de croissance exponentielle

Une forme assez simple pour être utilisée dans un modèle empirique est la forme exponentielle. On l'obtient en supposant un taux relatif de givrage constant:

$$\frac{dM/dt}{M} = k \tag{6}$$

Le paramètre k nous donne l'augmentation relative de la charge par heure. Ainsi un $k = 0{,}04$ indique que la charge augmente de 4% à chaque heure.

En intégrant l'Équ. (6) on obtient une fonction simple à deux paramètres:

$$M = M_0 e^{kt} \qquad \text{ou} \quad \ln \left[\frac{M}{M_0} \right] = kt \tag{7}$$

Cette forme a l'avantage de pouvoir être utilisée avec un lissage de courbe par la méthode des moindres carrés, et ainsi permettre de quantifier assez bien les données expérimentales. De plus on constate que pour $k > 0$ on obtient un taux de givrage croissant ($d^2M/dt^2 > 0$) et pour $k < 0$ un taux de givrage décroissant ($d^2M/dt^2 < 0$). Le modèle peut donc servir à modéliser aussi bien une courbe convexe qu'une courbe concave de la charge en fonction du temps t.

Afin de trouver la signification du paramètre k en fonction des paramètres météorologiques, on récrit l'Équ. (1):

$$\frac{dM}{dt} = w V_n E_0 \left[\frac{E}{E_0} \right] D \tag{6}$$

Dans cette équation et les suivantes, l'indice $_0$ désigne l'état initial au début de l'événement de givrage mesuré. Puisque la différence des modèles se situe au niveau de la variation de la captation avec la grosseur de l'accrétion, on peut indiquer ceci par la relation suivante:

$$\frac{E}{E_0} = \left[\frac{D}{D_0} \right]^a \tag{7}$$

Pour $a < 0$ on trouve un modèle semblable à celui de Makkonen (1984), pour $a = 0$ un modèle de taux de givrage constant et pour $a > 0$, le modèle de taux de givrage croissant. En particulier si $a = 1$, on obtient:

$$\frac{dM}{dt} = \frac{w V_n E_0}{D_0} D^2 \tag{8}$$

D'autre part, on peut relier approximativement la charge de glace au diamètre caractéristique D par:

$$M = \frac{\pi D^2}{4} \rho_i \tag{9}$$

où ρ_i est la densité de la glace (kg/m^3). Cette équation est plus exacte pour un givrage sur un câble partiellement givré, puisque l'Équ. (9) néglige la différence entre la densité du câble et la densité du givre. Cette différence diminue lorsque le diamètre D de l'accrétion augmente de grosseur.

En combinant cette dernière expression (9) avec l'Équ. (8), on obtient:

$$\frac{dM}{dt} = \left[\frac{4E_w w V_n}{\pi \rho_i D_c} \right] M \tag{10}$$

Ainsi la valeur k est donnée en fonction des paramètres météorologiques par:

$$k = \left[\frac{4E_w w V_n}{\pi \rho_i D_c} \right] \tag{11}$$

Dans les sections suivantes, nous utilisons d'abord ce modèle pour analyser quelques événements de givrage au Mont Valin. Par la suite, une discussion permet de justifier la valeur de a = 1 utilisée plus haut.

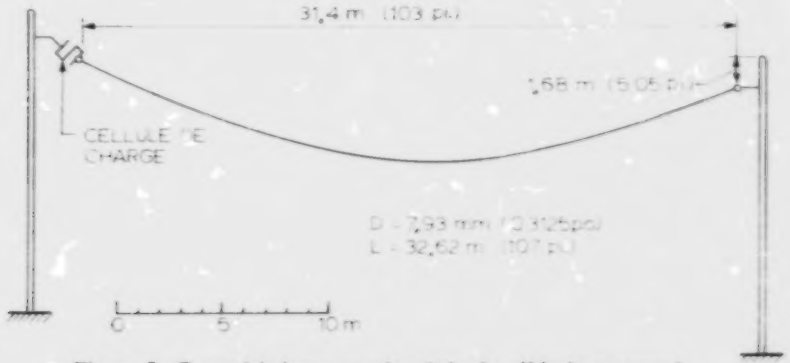


Figure 2: Caractéristiques et géométrie du câble instrumenté.

4. Mesures de givrage au Mont Valin

Nous avons installé un câble au Mont Valin (altitude 902 m) pour mesurer les charges résultant du givrage. La géométrie et les caractéristiques du câble sont données à la Fig. 2. Une cellule de charge mesure la tension du câble à son extrémité. Nous avons vérifié à l'étalonnage que la réponse de cette cellule était linéaire pour la mesure de la charge de glace. La température est mesurée par une sonde à thermistor. Un anémomètre à coupelles rotatives (Handar 430A) est utilisé pour mesurer la vitesse du vent et une sonde (Handar 431A) mesure la direction du vent. L'anémomètre est chauffé par rayonnement infrarouge afin d'empêcher son givrage. Cependant, ce chauffage s'est souvent avéré insuffisant et l'anémomètre ne fonctionnait pas toujours en période de givrage.

Les données sont recueillies automatiquement par un micro-ordinateur et retransmises au laboratoire sous forme numérique par la ligne téléphonique. Ces données sont ensuite mémorisées et analysées par un autre micro-ordinateur au laboratoire (micro-PDP11).

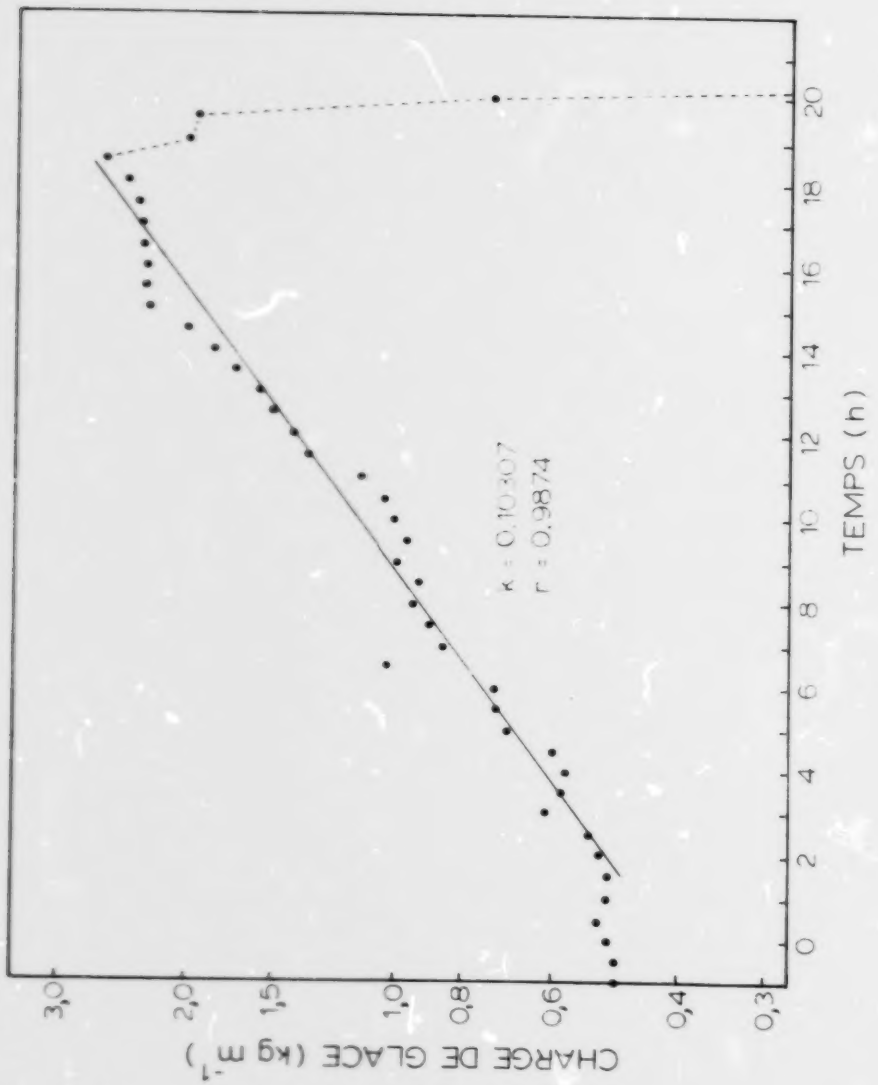


Figure 3: Courbe semi-logarithmique de la charge de glace en fonction du temps, 16 décembre 1984.

La mesure de givrage la plus importante a été réalisée le 16 décembre 1984 et est décrite à la Fig. 3. La pente de la droite sur une représentation semi-logarithmique est de $k = 0.10307$ avec un coefficient de corrélation r de 0.9874. La figure 4 décrit l'accumulation de glace les 25–26 novembre 1984. Dans ce cas, la baisse importante des vitesses de vent aux environs de 20h00 nécessite une division en deux parties de la période de givrage. Pour la première partie $k = 0.08823$ avec $r = 0.9835$ et pour la seconde $k = 0.03531$ avec $r = 0.9933$. La Figure 5, relative au 21 novembre 1984, est aussi divisée en deux parties parce qu'il y a eu une période sans givrage. Dans ce cas la valeur du paramètre k est à peu près la même pour les deux périodes. $k = 0.04380$ pour la première avec $r = 0.9643$ et $k = 0.04037$ avec $r = 0.9963$ pour la seconde. Finalement une accrétion de moindre importance est décrite à la Fig. 6. Pour cette courbe, $k = 0.1299$ avec un coefficient de corrélation $r = 0.9973$.

5. Vérification du taux relatif de givrage k

L'équation 11 permet une vérification de la pente k des courbes obtenues sur les Fig. 3 et 6. Le paramètre k est aussi le taux relatif de givrage d'après l'Équ. (6).

Afin d'obtenir une valeur calculée de k nous avons évalué les différents paramètres météorologiques de la façon suivante:

5.1 Teneur en eau de l'air et grosseur des gouttelettes

Ces deux variables n'ont pas été mesurées au mont Valin. Cependant puisqu'il s'agit de givrage sur le sommet d'une montagne, nous avons utilisé des données obtenues au mont Washington. Quarante-et-un tests faits avec les multicylindres rotatifs ont donnés les résultats suivants:

$w = 0.48$ g m^{-3} coef. var. = 40.59%
$d = 11.86$ μm coef. var. = 30.38%

5.2 Coefficient de captation et densité du givre

Il s'est avéré impossible d'utiliser E_0 calculé à partir du diamètre D_0. En effet le calcul donné dans la dernière colonne du tableau 1 donne une captation nulle dans tous les cas, sauf un. En effet, pour un paramètre de Stokes de $K < 0.125$, $E_0 = 0$. Or, avec les vitesses de vent moyennes obtenues et les grosseurs de gouttelettes de nuages, K est inférieur à 0,125. Cette constatation permet de conclure que la valeur calculée de E_0 sous-estime grandement la captation par un câble givré. Afin de vérifier la pente de la courbe empirique nous avons utilisé la valeur suivante:

$E_0 = 0.5$ coef. de var. = 50%

La masse volumique du givre utilisée est

$\rho_i = 800$ kgm^{-3} coef. var. = 15%

ce qui correspond au givre lourd obtenu dans les quelques cas vérifiés.

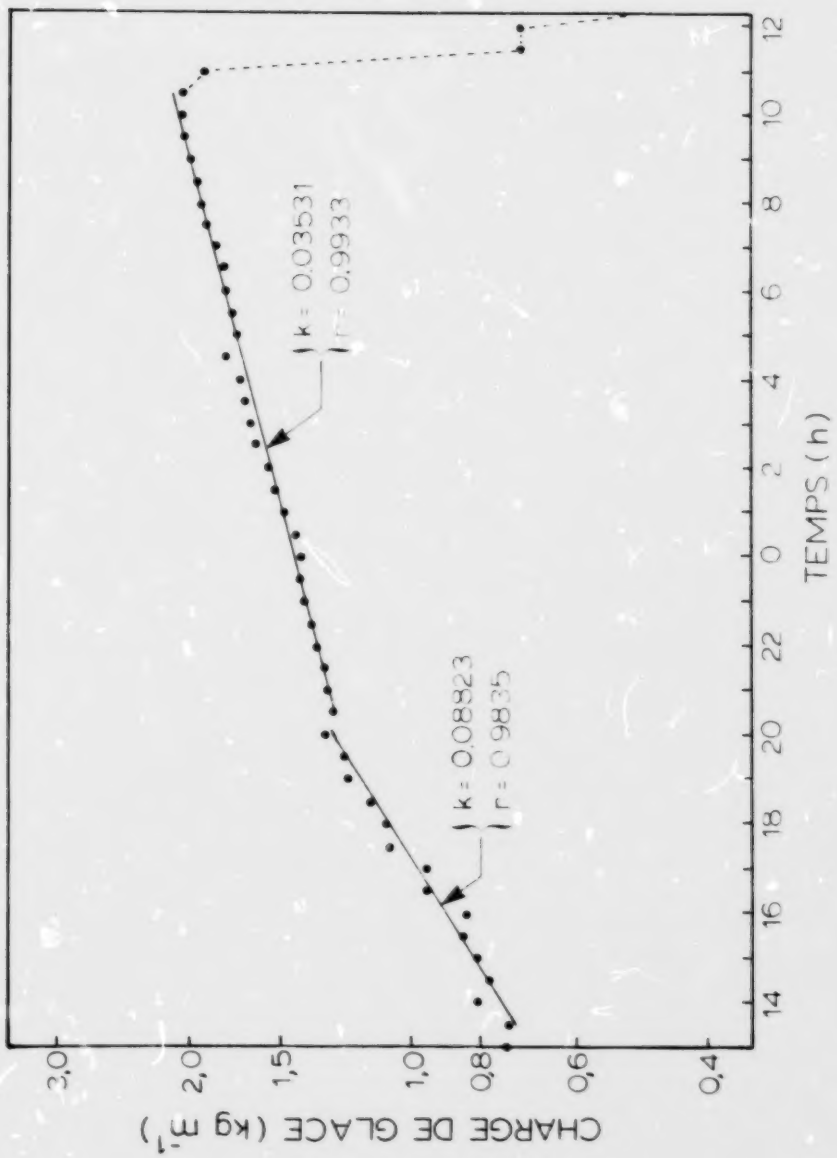


Figure 4: Courbe semi-logarithmique de la charge de glace en fonction du temps, 25-26 novembre 1984.

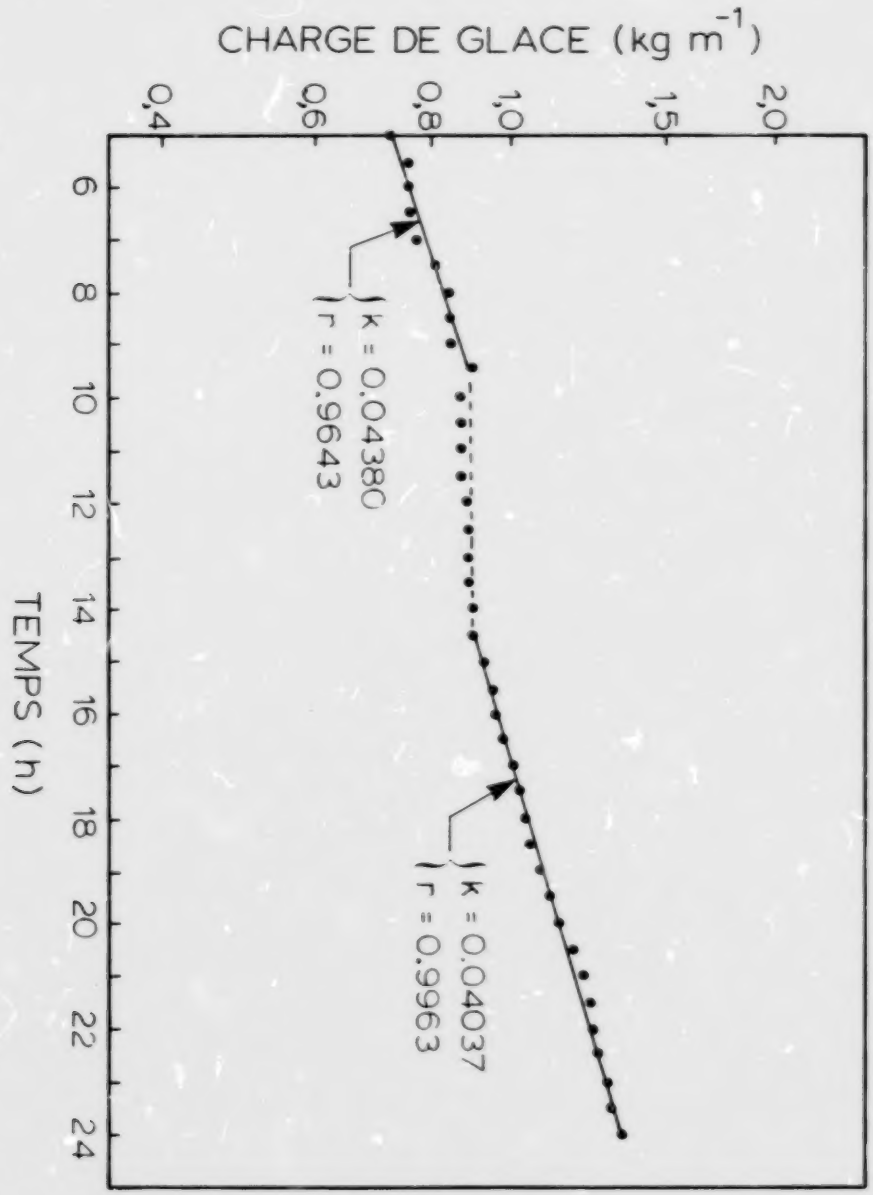


Figure 5: Courbe semi-logarithmique de la charge de glace en fonction du temps, 21 novembre 1984.

5.3 Diamètre initial moyen et vitesse du vent

Pour déterminer le diamètre initial moyen D_0, on utilise le poids initial M_0 au début de l'événement et l'Équ. (9).

D'autre part, la vitesse de vent est une variable mesurée. La mesure donne une moyenne, pour chaque demi-heure, de l'intensité et de la direction du vent. Pour tenir compte de la direction du câble, on calcule la composante du vent dans une direction normale au câble:

$$V_n = |\bar{V}| \cos (\Theta - 21°) \qquad (12)$$

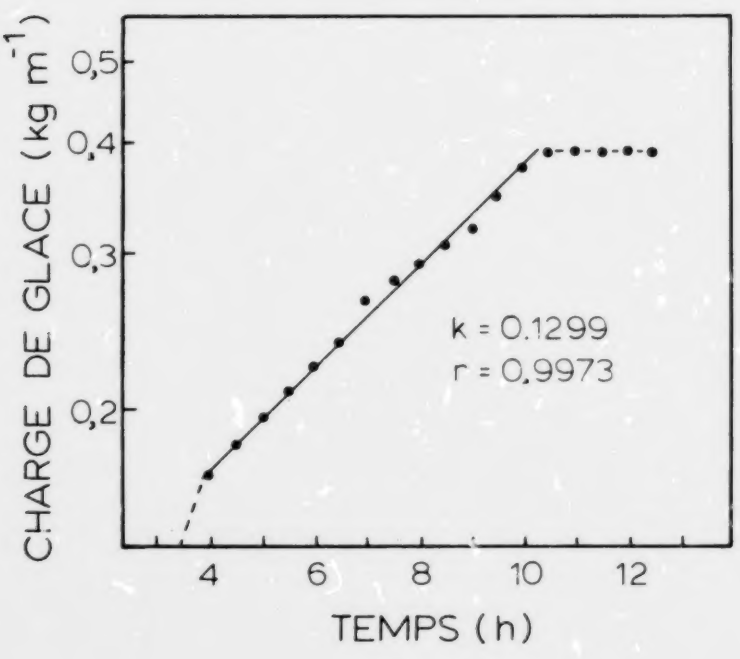


Figure 6: Courbe semi-logarithmique de la charge de glace en fonction du temps, 12 novembre 1984.

Tableau I Comparaison de la pente k calculée et mesurée

Événements de givrage		Vitesse $m \cdot s^{-1}$		Diamètre moyen (m)	k calculé		k mesuré	E_0 calculé
#	date	moy.	coef. var.		moy.	coef. var.		
A1	21 nov.	3,11	16,8%	0,0352	0.121	66,5%	0.044	0
A2	21 nov.	0,83	17,7%	0,0388	0.029	60,8%	0.040	0
B	12 nov.	3,48	36,3%	0,0290	0.165	73,9%	0.103	0
C1	25 nov.	3,57	25,8%	0,0352	0.139	69,4%	0.088	0
C2	26 nov.	0,57	39,3%	0,0453	0.017	75,4%	0.035	0
D	16 déc.	3,88	36,9%	0,0181	0.0295	74,2%	0.130	0,015

5.4 Comparaison de la pente k calculée et mesurée

Le tableau I compare les valeurs de k calculées avec celles mesurées à partir des courbes empiriques pour 4 événements de givrage. Cependant, deux des événements sont divisés en deux périodes de givrage, ce qui donne un total de six valeurs de k. On remarque que la valeur calculée est supérieure à la valeur mesurée pour les taux de givrage plus importants. Par contre, pour les deux cas où le taux de givrage est faible, le k mesuré est supérieur au k calculé. Dans tous les cas, cependant, la valeur mesurée se trouve à l'intérieur d'un écart-type de la valeur calculée. Le coefficient de variation de cette valeur calculée a été obtenu de façon habituelle à partir des coefficients de variation des différentes variables:

$$V_k^2 = \sum_i V_i^2 \qquad (13)$$

Plusieurs explications peuvent justifier les écarts et ces explications sont reliées au degré d'incertitude des différentes variables. Pour les taux de givrage élevés, il se peut que le coefficient de captation soit surévalué à $E_0 = 0,5$, car les calculs le donnent pour à peu près nul ($E_0 = 0$). Quant aux deux cas où le taux de givrage est faible, on constate qu'il s'agit de cas où la composante normale du vent est faible. Or, pour un câble réel à trois dimensions, l'équation (12) sous-estime l'effet d'un vent dans la direction du câble, puisque la courbe du câble expose une plus grande surface au vent que celle calculée.

6. Effet de la rugosité sur le coefficient de captation

Les mesures expérimentales pour le givrage des câbles semblent confirmer une croissance exponentielle de la charge. Ce taux de givrage croissant n'est pas obtenu lorsqu'on calcule la captation E numériquement. Cette différence est illustrée par le modèle de Makkonen

(1984). Cette courbe de M en fonction de t se divise en deux parties. Dans la première partie, la courbe de croissance est très semblable à une droite. Ceci s'explique par le fait que, pour un coefficient de captation d'environ 0,5, une diminution est possible lorsque la grosseur de l'accrétion augmente. Dans un tel cas, on peut donc avoir l'exposant a de l'Équ. (7) approximativement égal à -1, et ainsi obtenir un taux de givrage à peu près constant, ce qui donne une augmentation linéaire de la charge en fonction du temps. Cependant, pour des petites valeurs de captation, E/E_0 doit tendre de façon asymptotique vers zéro, ce qui amène également le taux de givrage à zéro. Toutefois, si le coefficient de captation tend plutôt vers une limite inférieure E_f, l'Équ. (6) donne plutôt un modèle d'intensité constante de givrage après un certain temps, c'est-à-dire une courbe concave de la charge M en fonction du temps t.

De plus, les valeurs calculées du coefficient de captation n'ont pu être vérifiées que pour de petits cylindres rotatifs pendant de courtes durées, c'est-à-dire lorsque l'accrétion reste circulaire et lisse. En effet, il semble que la rugosité croissante des accrétions de givre augmente sensiblement la captation (Personne et Gayet, 1984). On sait que les excroissances de glace, malgré leurs tailles plus faibles, ont un coefficient de captation supérieur. D'autre part, les gouttelettes entraînées autour de l'accretion doivent contourner la surface de façon tangentielle. Il y a donc une plus forte teneur en eau locale de l'air, susceptible d'être captée par les excroissances de givre en surface. En résumé, quoiqu'il soit difficile de quantifier l'effet de la rugosité de surface sur la captation, il y a sûrement augmentation de l'accrétion de givre par rapport à un cylindre lisse.

Un autre effet augmente également la captation réelle par rapport à la valeur calculée. L'écoulement de l'air comporte toujours un certain degré de turbulence à l'approche du câble givré. Comme les gouttelettes de plus faible diamètre sont plus facilement entraînées par la turbulence, elles peuvent avoir une composante de vitesse aléatoire non négligeable à l'approche de l'accrétion. Ainsi une partie des gouttelettes contournant le givre seront captées grâce à cet effet de turbulence.

7. Conclusion

L'analyse de quatre événements de givrage mesurés au mont Valin à l'automne 1984, débouche sur les conclusions suivantes:

1. Les courbes empiriques de la charge de glace M en fonction du temps sont bien décrites par une fonction exponentielle lorsque les conditions météorologiques demeurent constantes.

2. Le coefficient de captation calculé de façon numérique en deux dimensions pour un cylindre (méthode de Langmuir) sous-estime la captation d'un câble givré. La forme très rugueuse de la surface de l'accrétion et la turbulence de l'air sont probablement responsables de cette différence.

3. Les deux paramètres les plus importants pour le givrage en montagne sont la teneur en eau de l'air (w) et la vitesse de vent dans une direction normale au câble (V_n).

4. Comme le vent se comporte toujours de façon aléatoire, une approche statistique pour les valeurs des principaux paramètres permet de vérifier les taux de givrage obtenus au mont Valin. Toutes les valeurs du taux relatif de givrage k mesuré se trouvent à l'intérieur d'un écart-type des valeurs calculées.

8. Remerciements

Le projet de recherche sur le givrage au mont Valin a été financé par le CRSNG et le MEQ. Les auteurs remercient en particulier Radio-Québec pour la permission d'installer l'équipement sur son emplacement et Hydro-Québec pour son aide dans l'installation du câble et le transport au mont Valin en hiver.

9. Références

Brown, R. and S. Krishnasamy (1984) "Climatological Ice Accretion Modelling." Canadian Climate Center, Report 84-10 (Unpubl.).

Chaîné, P., Skeates, P., (1974) "Sélection des critères de la charge due à la glace et au vent" Météorologie industrielle, Étude V, Service d'environnement atmosphérique, Toronto, 16 p.

Diem, M. (1956) "Charge de glace sur les lignes haute-tension en montagne" Archiv Meteor. Geophys. Bioklim., Vol. B7, p. 84-95 (en allemand).

Egelhofer, K.Z., S.F. Ackley and D.R. Lynch (1984) "Computer Modelling of Atmospheric Ice Accretion and Aerodynamic Loading of Transmission Lines." Second International Workshop on Atmospheric Icing of Structures, Trondheim, Norvège, 19-21 juin.

Horjen, I. (1983) "Icing of Offshore Structures — Atmospheric Icing." Norwegian Maritime Research, Vol. 3, p. 9-22.

Langmuir, I. and K.B. Blodgett (1946) "A Mathematical Investigation of Water Droplet Trajectories." In Collected Works of I. Langmuir, Pergamon Press, p. 348-393.

Makkonen, L. (1984) "Modelling of Ice Accretion on Wires." Journal of Applied Meteorology, Vol. 23, p. 929-939.

McComber, P. (1984) "Numerical Simulation of Cable Twisting Due to Icing." Cold Regions Science and Technology, Vol. 8, p. 253-259.

Nikiforov, P. (1983) "Icing Related Problems: Effect of Line Design and Ice Load Mapping." In CRREL Special Report 83-17, p. 239-245.

Personne, P., Gayet, J.G. (1984) "Étude théorique et étude expérimentale en soufflerie du phénomène d'accrétion de givre sur les lignes électriques aériennes" J. Rech. Atmos. 18, n° 4, pp. 263-279.

Smith, B.W. and C.P. Barker (1983) "Icing of Cables." In CRREL Special Report 83-17, p. 41-49.

LAURENTIAN UNIVERSITY
Ramsey Lake Road
Sudbury, Ontario
P3E 2C6

(705) 675-1151

Laurentian University

DISTANCE EDUCATION: A NORTHERN SOLUTION?

Marian Croft
Director, Centre for Continuing Education, Laurentian University

Abstract: Distance Education has been used by Ontario universities since before the turn of the century to provide university programs to adults who are unable to attend traditional classes. Currently, 12 of Ontario's universities have distance education programs using broadcast or cablecast television, video-tape, teleconferencing, audio-cassettes or print. In 1983 the Council of Ontario Universities, recognizing the growing importance of distance education, created a standing committee to discuss the co-ordination of future developments. Among its accomplishments are a comprehensive listing of all distance education courses by discipline, the first of its kind in Canada.

Laurentian University, serving an area twice the size of France with a population of only 650,000 in scattered communities throughout Northeastern Ontario, is committed to the provision of university-level programs through distance education. The university has been a leader in the provision of continuing education programs to nurses and has recently accepted an innovative proposal to combine distance education methods and technology with satellite campuses to provide a Post RN BScN degree across the North, in co-operation with Lakehead University.

The special needs of the people of Northeastern Ontario include bridging programs for francophones to bring them to university entrance, the provision of basic and graduate commerce programs to help increase the economic base of what are essentially single-industry towns, and the provision of continuing professional education for teachers, social workers, etc. in isolated communities, to name only a few. Laurentian is attempting to meet these needs and further its regional commitments in a climate of steadily declining government support. Cutbacks have caused a significant retrenchment in an off-campus program which once serviced over 40 communities. In spite of this, developments in the distance education program have continued, with the recent development of a teleconferencing network serviced through the bridge at the Northeastern Ontario Telehealth Network, added to existing courses by television, audio-cassette and print. The university is also involved in co-operative ventures with TVOntario.

The paper concludes with a brief discussion of strategies for the future.

Résumé: Les universités ontariennes ont utilisé l'enseignement à distance dès avant 1900, pour donner des cours universitaires aux adultes se trouvant dans l'impossibilité d'assister aux cours habituels. Actuellement, douze universités ontariennes exploitent des programmes d'enseignement à distance par télévision hertzienne ou câblodistribution, vidéo-cassettes, téléconférences, cassettes ou textes imprimés. En 1983, le Conseil des universités de l'Ontario, ayant pris conscience de l'importance croissante de l'enseignement à distance,

créa un comité permanent pour étudier la coordination des progrès à venir. La compilation exhaustive d'un répertoire des cours d'enseignement à distance, classés par disciplines et premier de son genre au Canada, a été l'une de ses réalisations.

L'Université Laurentienne, dont le champ d'action couvre deux fois la superficie de la France mais ne contient qu'une population de 650 000 habitants, disséminés dans les agglomérations du Nord ontarien, a assumé l'exploitation des programmes d'enseignement universitaire à distance dans cette région. Elle a frayé la voie en matière de programmes de recyclage en sciences infirmières, et a récemment donné suite à une proposition novatrice d'association des méthodes et techniques de l'enseignement à distance avec la mise en place d'établissements satellites afin de fournir un enseignement de baccalauréat en sciences infirmières aux infirmières agréées du Nord canadien, en collaboration avec l'Université Lakehead.

Parmi les besoins particuliers des habitants du Nord-est ontarien, on compte les programmes propédeutiques pour les Francophones désireux de s'inscrire dans une université, les programmes d'enseignement de base et supérieur en sciences commerciales visant à développer l'infrastructure économique de ces agglomérations en fait monoindustrielles, et la formation professionnelle permanente des enseignants, des travailleurs sociaux, etc. dans les collectivités isolées, pour n'en citer que quelques-uns. L'Université Laurentienne s'efforce de satisfaire ces besoins et de développer son action régionale à une époque de réduction des crédits publics. Cette dernière a causé une contraction notable d'un programme d'enseignement hors-université ayant desservi jusqu'à 40 collectivités. En dépit de ces difficultés, l'Université continue d'étendre son programme d'enseignement à distance, par la mise en place récente d'un réseau de téléconférences fonctionnant par le truchement du Northeastern Ontario Telehealth Network, afin de compléter les cours existants fournis par la télévision, les cassettes et les textes imprimés. L'Université Laurentienne participe également à des actions menées en collaboration avec TV-Ontario.

L'auteur termine son exposé par une courte étude des stratégies pour l'avenir.

Lifelong learning: the new reality

This is a time of substantial technological change, requiring a commitment to lifelong learning, both for the acquisition of new skills and to transform old experiences into new meanings. The information economy is replacing the industrial economy, with a resulting shift in the educational prerequisites for employment. This requires an intelligent choice of technologies that will serve not only economic and strategic goals but also long-range social and ecological objectives.

Knowledge is power, but now the field of knowledge is expanding by leaps and bounds so the life span of some professions is being measured in years instead of decades. Lifelong learning has become a necessity. Education is considered to be the answer for a rapidly changing world, while at the same time it is an area affected profoundly by societal changes. Universities are being subjected to growing social pressure to respond favourably to the demands of adult education.

Computer-assisted learning packages are being developed, courses are being taught by audio cassette, by television, by teleconference — the field of distance education has expanded as fast as new technologies have appeared, with the promise of ever greater potential through developments such as satellite transmission, video discs, video-teleconferencing and two-way interactive telidon.

Distance education has also expanded because of human pressure, as people's lifestyle has demanded more flexibility. While many students learn at a distance because they have no choice (home or job commitments or unavailability of programs), many choose to learn outside the traditional classroom environment because of unpleasant memories of childhood learning experiences or because of the challenge of self-directed learning. In Northern Ontario, students in isolated communities find distance education opens the university to them.

"Distance education" can be a misleading term and in fact requires only the tangible separation of the learner and the tutor. Within that broad construct lies a variety of possibilities, including correspondence study, interactive television and teleconferencing. The actual distance may be as much psychological as physical. Administratively, distance education requires substantial and senior internal institutional support to be successful, mainly because it requires a marshalling of the institution's human and capital resources and because the bulk of its costs are up front.

The development of distance education in Canada generally and at Laurentian University specifically provides a valuable foundation for assessing current initiatives and options for the future.

A brief history of distance education in Canada and Ontario

Contrary to popular thought, distance education is not a rural phenomenon. It began in the industrial cities of nineteenth century England, Germany, Scandinavia and the United States. Only in Canada and Australia, where large areas of land are still sparsely populated, do many distance education strategies show learners and tutors working at great distances. In Canada, by far the majority of registrations are still to be found in urban centres because distance education strategies increase access and provide more flexible methods of learning than are provided in traditional classroom-bound contexts. Sixty per cent of the University of Waterloo's distance education students live in urban areas.

Before the turn of the century, Queen's University had begun its program of correspondence courses, which, in conjunction with its summer school, permitted adult students (mainly teachers) to earn a degree. This model was subsequently adopted by many other Canadian universities. The University of Toronto used correspondence preparation for some of its summer school courses. The need to provide for a uniform standard of education across provincial borders led to the development of print-based distance education courses by professional organizations.

University involvement in these programs was at first concentrated in Queen's and the University of Toronto. Within many professional groups and particularly in the various organizations of accountants, print-based course training became a requirement even for university graduates preparing for professional examinations. Concurrently, similar

programs were also being developed and used by provincial agencies for primary and secondary school students and for vocational training.

The late 1960's and early 1970's saw the birth of a large number of distance education facilities, including the Tele-Université du Québec, the Open Learning Institute of British Columbia (OLI) and Athabasca University as well as a variety of provincial communications authorities such as ACCESS/Alberta, TVOntario and the Knowledge Network of the West (KNOW).

More recently, in March 1984, the ministers of education of British Columbia, Alberta, Saskatchewan, Manitoba, the Northwest Territories, the Yukon and the Federal Minister of Inter-Governmental Affairs signed a letter of agreement to create a Distance Education Committee to consider collaborative development and acquisition of distance education materials. In September 1984, the British Columbia government created the Open University Consortium including all provincial universities, KNOW and OLI. In May 1986, a bill was presented to the legislature to combine KNOW and OLI into an open learning authority. In Atlantic Canada, the Atlantic Provinces Commission on Higher Education created the new position of Director of the Office of Educational Communications. The Atlantic Provinces Association for Continuing University Education was granted $20,000 by the Ministry of State for Science and Technology for a project entitled "Consortial Atlantic University Programming on the Personal and Social Impacts of Technological Change". In late 1985, the government of Manitoba gave one million dollars to the University of Manitoba to develop its distance education program.

In Ontario in 1982, the Council of Ontario Universities (COU) commissioned a review of distance education delivery of university-level programs. Following the report, COU created in March of 1983 a standing committee on distance education to encourage cooperative developments in the field. In Ontario 12 of 16 universities are currently engaged in some form of distance education for undergraduate degree credit, graduate work, professional upgrading or designation and career development. Leaders in the field include Wilfrid Laurier, the only on-going producer of broadcast-quality material (5 courses on air), the University of Ottawa, with an extensive audio-teleconferencing program, the University of Waterloo, with over 6,000 students each year in its audio-cassette correspondence program, and Laurentian Univesity, with Canada's largest multi-media based bilingual program offering degrees in several disciplines. Although it is difficult to establish directly comparable figures, estimates are that over 30,000 Ontarians are served through university level distance education programs. The 1983 Snowden Report estimates that in the short run 25,000 — 30,000 additional Ontarians are likely to be attracted to new distance education programs.

Considering the constraints on the existing university system which show no signs of improving, and the immense distances to be covered in Northern Canada, this alternative form of education is well worth examining, not only for part-time but also for full-time study. A judicious combination of traditional and distance education formats holds a promise for lifelong learning, and for making available post-secondary degree credit programmes to large sections of the Canadian population who would otherwise never be able to participate.

Distance education at Laurentian University

Laurentian University was created in 1961 to serve the needs of Northeastern Ontario, a geographic area twice the size of France, with a current population of 650,000. The university is the major partner in a system of on-campus federated church-based colleges and affiliated university colleges in Sault Ste. Marie, 300 kilometres west of Sudbury, Hearst, over 600 kilometres north and North Bay, 120 kilometres east. Undergraduate degrees are available in Arts and Science, Engineering, Social Work, Commerce, Education, Nursing and Human Movement. Graduate programs are offered in Arts, Science, and Business Administration. Many programs are offered in English and French.

Envision, Laurentian's Distance Education program, began in 1972 as an innovative attempt to bring university courses to a scattered population with no tradition of university participation. Over 100 courses have been created over the years.

Currently, Laurentian has over 60 courses available via printbased correspondence, audiocassette, television, video-cassettes in learning centres in 25 communities and teleconferencing. Degrees are available in English, in Psychology, Law and Justice, and Religious Studies. An additional degree in Sociology will be completed shortly. In French, a total of ten courses are offered in various subject areas, with a major expansion effort underway, and four new courses to be ready by fall, 1987.

The university produces over 90% of the courses it utilizes. Two courses have been produced in collaboration with TVOntario and several other universities. Some are leased from other universities. It is Laurentian's policy not to duplicate course development wherever possible.

Recent changes in the development process will incorporate a course team model, including three content experts, an instructional designer, course editor and graphic designer. As part of the process, the Centre for Continuing Education, which administers the program, has produced a distance education course development manual to provide guidelines for all courses and is planning faculty workshops on course design. Overall academic responsibility for courses rests with the Senate Committee on Continuing Education.

Northeastern Ontario has special educational needs which can be addressed via distance education. The area incorporates many small, isolated communities which are single-industry towns, based on the primary resource industries of mining and forestry. Participation rates in university programs, although increased significantly with the presence of Laurentian, are still lower than provincial norms. As well, levels of high school completion are lower than in the South. The population of Northeastern Ontario is 40% francophone. Here participation levels are even lower and the university, through the Centre for Continuing Education, is currently developing a series of non-credit bridging programs delivered via distance education. Similar programs are being developed in English and are being considered for the area's large native population.

Continuing professional education is essential for individuals in teaching, social work and nursing. Laurentian was a founding member of the Northeastern Ontario Telehealth Network, (NOTN) which links over 30 area hospitals by audio-teleconference. The university has added several additional sites and now has a dozen separate locations set

up. Bridging is done through Darome equipment at NOTN. A pilot project has just concluded successfully and plans call for a minimum of three courses next year, including an introduction to social work in French and the first courses for the Post-RN degree.

Since its inception, Laurentian has attempted to service various off-campus communities with traditional face to face instruction. Over the years, over 40 different communities from Moosonee, 600 kilometres north, on James Bay which can be reached only by rail or air, to Windsor in the south, have hosted courses and on occasion complete programs. However, in the last few years Ontario has slipped to ninth place in provincial government support to universities. Being new and bilingual, Laurentian has experienced significant financial difficulties as it attempted to fulfill its regional commitments. During the last year, off-campus programs ran in 18 communities, with the majority of the courses offered in education (français). The implementation of teleconferencing will, it is hoped, reverse this trend, as fewer students are required for financially viable programming. Normally the university requires approximately ten students for face-to-face instruction whereas distance education courses by teleconference require an average of only five students per site. In other distance education courses, faculty are paid for each student who registers, so no courses are cancelled, no students are disadvantaged.

Laurentian also believes that some courses are best offered by television and has been a leader in educational telecourse production. When the university decided costs were too great to continue independent production, proposals were initiated to work co-operatively with TVOntario and sister institutions. One series has been completed and a second is now underway. These programs are then aired on the provincial network, increasing access. As well, courses are now being leased from Wilfrid Laurier University. The courses which are not broadcast are available for viewing at one of Laurentian's 25 regional learning centres or video-cassettes may be mailed to students outside this area.

Much interest has recently been generated by the feasibility study for the provision of Laurentian's unique Post-RN BScN degree using an innovative blend of distance education methods and technology with face to face instruction on satellite campuses. Central to the success of the program will be the development of a network of clinical experts throughout the North who are qualified to supervise the practical component of the degree. The Telehealth Network will be utilized fully, and the first courses in the programme will begin in January, 1987.

Critical to the implementation of any sound distance education program is an understanding of the many aspects of course development and design.

Course development and design

Distance education, because of the separation of teacher and learner, requires a different approach to course design. As well, the experience and learning objectives of adult students have had some impact on the design process. In many cases this may require the re-organization of course material itself, as the emphasis switches to the learner.

Distance education course design is in itself a subtle professional development exercise for faculty members. The design process incorporates a collaborative model so, for possibly the first time, a faculty member may find him/herself working as part of a design team,

with other members including both content and process experts. In this model, learning objectives must be specified and course development must adhere to these objectives. It has been the experience of learning designers that this process impinges favourably on classroom teaching. The final result of the course team, multi-skill process is a high quality product. Members of the team may include a content specialist/writer, an instructional designer, and audio-visual producer, an editor and a graphic designer. Even more interesting, evidence suggests that the course work produced by the learner is as good as, if not better than, that produced in classrooms.

The development of a distance education course generally follows a specified sequence. First, the course material is divided into obvious units. Learning objectives are then established for each unit. These objectives should be sequential, with each unit building upon those preceding it, integrated with the course material as a whole, relevant to the overall objectives of the course and achievable. Each unit should provide a number of opportunities for the student to test his or her progress in achieving the objectives, either through self-assessment or instructor/tutor evaluation. The learning process itself should be evaluated by the student and the tutor to ensure that it is suiting both the student's needs and the course requirements. Finally, at the conclusion of the course, all aspects of it should be evaluated in terms of intended learning outcomes.

Not long ago, studies of distance education activities stressed "the loneliness of the long distance learner". This is changing as course designers increasingly build into the course a series of meetings, either in person, by phone or by audio-teleconferencing. Studies have proven that this form of contact cuts attrition significantly and enhances the learning experience.

Costs and benefits of distance education development

There are many misconceptions associated with the development of distance education programs. Universities assume either that costs are prohibitive or that they are so low that quality education cannot result. The truth is far more complex and involves difficult questions of institutional reward systems, and the societal responsibility of universities.

Faculty participation in continuing and distance education initiatives is difficult to ensure for two reasons: first, development fees are normally not in line with external consulting fees and second, this participation is at best, not considered, at worst, considered negatively, for tenure and promotion. Exceptions to the latter situation exist at the Universities of Guelph and Victoria, where both the quality and quantity of continuing education participation are considered.

In addition to the cost of faculty resources other development costs include the personnel on the course team, the rental of supplementary material (including copyright clearance) travel and honoraria. Distance education is not "education on the cheap", neither is it as exorbitantly expensive as it may appear at first glance. Costs for distance education courses are front-end loaded, but because of careful planning of course materials, these costs may be amortized over an expected five-year lifespan of the course. It is virtually impossible to compare cost across programs and technologies.

Of far greater significance to the university than the cost of individual course development is the question of what the university loses in terms of its reputation for leadership, excellence and innovation, opportunities for research, and opportunities for staff development if it continues to restrict its teaching activities to the classroom. Such restriction is clearly no longer appropriate to adults locked into busy working lives and coping with the stresses of overwhelming social and economic changes.

Strategies for the future

As more post secondary institutions become involved in distance education, increasing financial resources are brought to bear on development work. Unfortunately, this more often than not results in significant duplication of effort. In an attempt to halt this duplication, the Canadian Association of University Continuing Education has for many years published a distance education directory, copies of which are available from AUCC (The Association of Universities and Colleges of Canada). As well, the Council of Ontario Universities now publishes a similar booklet for Ontario only. These directories allow sister institutions to see at a glance what has been produced elsewhere and, it is hoped, to consider utilization of existing courseware instead of duplication. It is at best a passive form of collaboration which in Ontario is now assuming a more active form through various initiatives of the Council of Ontario Universities Distance Education Committee.

Over the last four years, provincial and federal governments have shown increasing interest in distance education. Talk of "rationalizing" development has been prevalent, and several initiatives to this end have already occurred. Co-operation and collaboration on course development will no doubt assume increasing importance. However, while it is remarkably easy for universities to discuss co-operation, it is remarkably difficult to make it happen. Guidelines for collaborative development of courses do not exist.

In the meantime, several private companies are expanding their activities to include distance delivery of an existing or new product. The Campion Language Institute has created high quality packages in several languages with course development work being done by university faculty across Canada. Northland Open University, operating under federal letters patent and not accredited by AUCC, has initiated an aggressive marketing campaign, offering bachelor's degrees in commerce and engineering, while its affiliate, the Canadian School of Management, offers MBA's. The universities of Canada may be assured that poor quality production and presentation of distance education material will not be accepted by an increasingly sophisticated market. Again, if we are unable to afford quality production singly, collaborative development simply makes good sense in a competitive marketplace.

Given the significant costs of course development and the inaccessibility of university programmes for residents of Northern Canada, some form of government intervention may be necessary. Separate funding for course development, academic counsellors, equipment and communications networks would encourage universities to broaden their commitments.

The obligation to do quality work extends to the area of substance, not simply form. A glossy kit of materials which are not well put together brings no credit to us. Every university which makes a commitment to distance delivery should also, must also, make

a commitment to instructional design and the provision of services to those students who learn at a distance. No university should ever move into distance education simply because it is seen as a potential source of easy revenue — our traditions of excellence must extend to this highly visible form of education.

In order to enhance the stature of distance education within universities, we must integrate the course development process into our criteria for tenure and promotion. We must encourage and promote research in the field of andragogy, with special emphasis on distance delivery. Only by succeeding here can we raise the academic profile of course design. By extension, the quality of teaching on our campuses will also increase.

As we gain more experience working with various technologies, we will be able to make more considered judgements on the benefits of each to the learner. Some material lends itself to graphic representation, some to television production, while some requires the exchange of ideas possibly by teleconference or the face to face contact of the classroom. Possibly, judicious blending of technologies may be the answer, with courses including a print base, audio and video cassettes, teleconferenced seminars and face to face interviews between students and instructors.

To ensure a consideration of the needs of Northern residents, the Association of Canadian Universities for Northern Studies should consider the creation of an advisory panel to monitor developments across the country, make requests for programs resulting from needs assessments and act as liaison between southern universities and northern agencies.

Finally, as universities become increasingly aware of the need to open access to their programs in times of financial restraint, there can be little doubt that distance education truly democratizes access in a systematic, planned manner.

Bibliography

Blackburn, D.J., editor, Extension handbook. Guelph: University of Guelph, 1984.

Burge, E.J., J. Roberts and M. Waldron "Audio-Teleconferencing in Continuing Education: A Case Study with Implications". Canadian Journal of University Continuing Education, V.X., no. 2, November, 1984, pp. 20–30.

Croft, M. "W.L.U. Telecollege: Distance Education by Television". Bulletin, I.C.D.E., Vol. 11, May, 1986. pp. 26–30.

Croft, M. and H. Mills "Distance Education and the University of Toronto". Internal working paper, 1985.

Daniel, J., M.A. Stroud and J.R. Thompson, Learning at a Distance: A World Perspective. Edmonton: Athabasca University/International Council for Correspondence Education, 1982.

Parker, L.A. and C.H. Olgren, Teleconferencing and Electronic Communications IV: Applications, Technologies and Human Factors. Madison, Wisconsin: Centre for Interactive Programmes, 1985.

Stahmer, A. and B. Helm, Communications Technology and Distance Learning in Canada. Ottawa: Department of Communications, 1986.

Smith, W.A.S. and B.L. Snowden, A Review of Distance Education in Ontario Universities. Toronto: Council of Ontario Universities, 1983.

THE GENESIS OF NATIVE STUDIES IN CANADA

Anthony J. Hall
Department of Native Studies,
University of Sudbury in Federation with Laurentian University

Abstract: The object of this essay is to consider how the emerging field of Native Studies was, is, and could be situated within larger academic and social settings. To this end, some attention is devoted to how Native people in North America have been historically studied in universities, particularly within the discipline of Anthropology. The relationship of Native Studies to this academic tradition, as well as to the necessity for more truly inter-disciplinary approaches to Native-related themes, is examined. As well, the need of Native Studies to incorporate traditions of scholarship which grow directly out of Native forms of perceptual orientation is explored. A clear example of what is being advocated here is that Native Studies must afford recognition to the integrity of the distinctive world-views which are intimately bound up in the structure of Native languages. That care must be taken, however, to assure that the cross-cultural aspect of this study remains a two-way bridge of understanding — that the field's cultural bias does not close Native Studies to informative currents emanating from other parts of the Humanities and Social Sciences — this too is asserted. Finally, some reflections are presented about appropriate kinds of relationship for Native Studies to cultivate with Native communities and with government agencies.

Résumé: Dans cette étude, l'auteur s'efforce de déterminer comment le domaine des Etudes autochtones a pu, peut et pourra s'insérer dans un cadre universitaire et social plus ample. C'est pourquoi il consacre quelque attention à la façon dont les peuples indigènes d'Amérique du Nord ont naguère été étudiés dans les universités, et plus particulièrement au sein de la discipline de l'anthropologie. Il analyse les relations entre les Etudes autochtones et cette tradition universitaire, et expose la nécessité de suivre des approches vraiment interdisciplinaires des questions touchant les Amérindiens. De même explore-t-il les avantages de l'incorporation, à ces Etudes autochtones, des connaissances universitaires découlant directement des formes autochtones d'appréhension de l'extérieur. La prise en compte, par les Etudes autochtones, de la validité d'un concept de l'univers évoqué par la structure interne des langues indigènes, constitue un clair exemple de ce qu'il propose. On doit cependant maintenir ouverte la passerelle d'une meilleure compréhension mutuelle rendue possible par l'aspect interculturel des travaux. Il ne faut pas que la déformation professionnelle close les Etudes autochtones aux données issues d'autres domaines des sciences humaines. Enfin, l'auteur présente quelques réflexions au sujet de la nature des liens à établir entre ces Etudes autochtones, les collectivités amérindiennes et les organismes publics pertinents.

By any measurement, Aboriginal people in Canada represent a relatively small minority of the country's total population. Depending on how one goes about defining "Nativeness," there are somewhere between 500,000 and 1,200,000 individuals of Aboriginal ancestry in this land.[1] Somewhat fewer than 400,000 of them are officially

registered by the government as so-called "status" Indians, while about 30,000 are Inuit.[2] Hence, at most, this country's Native constituency makes up about four per cent of those currently living in Canada. When one considers national population figures in regional rather than absolute terms, however, quite a different picture crystalizes in the mind's eye. When looked at in this light, it can fairly be said that Native people constitute the majority culture over the largest part of the sparsely-populated Canadian landmass. In areas such as the James Bay watershed and the Eastern Arctic — indeed, throughout much of the territory thought of as "The North" by the larger number of Canadians whose permanent habitations tend to be crowded along the country's southern borders — it is Native people who still predominate.

Recognition of the Aboriginal fact, then, (to adapt a phrase borrowed from another distinctly Canadian context) is a basic requirement of any sound approach to the study of present and future social patterns in the Canadian North. Accordingly, whether the topic is resource development, health care, local government or virtually any other subject with a human element, Native Studies represents an essential thrust of the academic advancement of Northern Studies in Canada. And while this holds for the exploration of present and future oriented themes, the Aboriginal fact looms even larger when the focus is shifted towards examination of the past. For it is Native history — a history with a depth of thousands and thousands of years in this land — that measures the greater part of the sum total of human experience in the North.[3]

It has been the growing attraction of the North as a suitable zone for scholarly research which is one of several factors behind the relatively recent rise of Native-related topics in the curricula of Canadian universities. This development, although far from universal, has taken a variety of forms. In many institutions of higher learning not only have the number of course offerings dealing with Aboriginality been increased, but faculty members from a variety of different disciplines have sometimes collaborated in the design of whole programmes where the study of Indian, Inuit and Metis people is emphasized.[4] In other universities across the country — in universities which by and large share the common characteristics of being quite small and new — departments of Native Studies have emerged as relatively autonomous academic units, administratively comparable to those of the more traditional academic disciplines. At Trent, Laurentian, Brandon, Manitoba and Lethbridge Universities, these departments of Native Studies took form relatively rapidly during the 1970s.[5] Although really in a class of its own, the Saskatchewan Indian Federated College of the University of Regina is also often counted among their number. The appearance of these new professional units on Canada's academic landscape took place roughly concurrently with the development of similar centres of teaching and research, sometimes known as American Indian Studies departments, in a number of universities throughout the United States.

A major purpose of this paper is to outline the development of Native Studies departments in Canada in the 1970s. In relating the emergence of Native Studies as a distinct academic area[6] — an area which, it is argued, is best understood as a cross-cultural, interdisciplinary field — attention is given to the wider historical context within which the genesis took place. As well, some reflections are offered on the nature of the intellectual and institutional tensions which must be faced if Native Studies is to mature successfully in the future. Implicit in all of this is the contention that Native Studies has a potentially instrumental role to play in the growing involvement of universities with the dynamics of change in

the Canadian North. But the question of how to turn awareness of the genesis of Native Studies toward more effective scholarly study of the North is left largely to the reader's own enterprise and imagination. For the principal thrust here is simply to explain the forces, as much as possible in their own terms and according to their own logic, which have given rise to a new departure in Canadian higher education.

In 1969, Trent University in Peterborough, Ontario became the first in Canada to offer a Native Studies programme.[7] On one level, it was a fortuitous combination of personalities that had enabled this to come about. Trent's founding President, Dr. Thomas H.B. Symons, was at the time embarking on a stage of his career which would see him play a major role in drawing public attention to the necessity of doing more to nurture indigenous forms of scholarship. This phase of his work, aimed ultimately at the enrichment of all research and teaching activities involving the study of Canada, took most concrete shape in Dr. Symons' authorship of *To Know Ourselves*.[8] A study commissioned by the Association of Universities and Colleges of Canada, this publication generated a large amount of media attention following its appearance in 1975.

During the years leading up to the publication of *To Know Ourselves*, Dr. Symons was actively involved in various initiatives to increase the level of public awareness about the particular kinds of circumstances facing Native people in Canada. Most of his work along these lines was with the Indian-Eskimo Association, of which he became President in 1972 following nine years of membership in the organization. When he assumed this responsibility, the old IEA was in the process of re-defining its role. Where in the 1960's it had acted as a principal locus of Aboriginal-affairs activity outside of the federal and provincial governments, many of its functions were then being assumed by a widening array of new Native-controlled organizations.[9] The transformation was symbolized by a name change in 1972, when the IEA re-titled itself as the Canadian Association in Support of the Native Peoples. In his inaugural statement as President, Dr. Symons included the following passage outlining his conception of CASNP's role:

> It is clear now, I think, that our essential continuing purpose must be to meet the need for an organization operating on a national scale to inform and educate Canadian citizens about the needs and the problems of native people. With this purpose in mind, our main task now should be to develop, far more effectively than we have ever done before, a national body of informed opinion, of informed and concerned citizens who can understand better and more fully than is now the case the problems which the native people are encountering, and who can thus be in a position to give them more effective support in a more informed and useful way.[10]

It requires little imagination to see a relationship between Dr. Symons' view of CASNP's educational responsibilities and the support he rendered Native Studies at his own university through its transformation from a programme to a full-fledged department in 1972. Beyond that, one might speculate that Dr. Symons' work in bringing academia a little closer to some of the particular concerns of Native people, was one of those factors which later caused him to ascribe such urgency to the whole range of issues involved in the establishment of truly indigenous forms of Canadian scholarship in all their many manifestations. Of course it is with Dr. Symons himself with whom the final word on such speculation must lie. Whatever information may yet be forthcoming, however, it

can now be said that the emergence of Native Studies at Trent University was part of a larger movement of academic nationalism which captured the imagination of some groups in English Canada in the 1970s. Such a perspective establishes Native Studies as one of those vehicles by which Canadian universities could engage themselves more fully in the process of intellectualizing the distinctive kinds of human experience rooted particularly in this land. Similarly it clearly marks Native Studies as an academic initiative with a strong leaning towards community service.

The Trent faculty member who was probably most instrumental in developing Native Studies at Trent University during Dr. Symons' Presidency was Professor Kenneth Kidd. After a long term as Curator of the Ethnology Division at the Royal Ontario Museum in Toronto, Professor Kidd had come to Trent as Chairman of the Department of Anthropology.[11] In this capacity he set in motion an advisory committee to explore the possibility of establishing Indian-Eskimo Studies, as it was then called. One of the realities explored by Professor Kidd and his colleagues was the low rate of participation by Native people in all facets of post-secondary education in Canada. It was learned, for instance, that in the five years following Trent's establishment in 1964, only two Native students registered in the University. And this was the pattern in virtually every institution of higher learning in every region in the country. It was in stressing this conspicuous under-representation — a lack of participation which for obvious reasons had the effect of helping to keep Native people out of many of the country's key theatres of economic enterprise and political decision making — that Professor Kidd and his colleagues were able to make their case for Native Studies. What was required, they maintained, was a new kind of academic unit which could serve as a home of scholarship in the University both for Native faculty and for Native students.

Similar scenarios were acted out in the years following, as other departments of Native Studies took shape in Ontario and the prairie provinces. Generally the development of each of these academic units was closely associated with the careers of particular individuals who had the ability to relate in professional terms both with Native communities and with the apparatuses of academic funding and curriculum approval. Dr. Samuel W. Corrigan, for instance, is one of those men. He brought to the task of founding the Native Studies Department at Brandon University experience in the area of Native adult education as well as the fruits of his Anthropology field work among the Sioux in the Qu'appelle Valley area in Saskatchewan.[12] At the University of Sudbury, a federated part of Laurentian University, Dr. J.W.E. Newbery was the driving force for the establishment of Native Studies. A United Church clergyman who was instrumental in the founding of Laurentian University, Dr. Newbery started including Native spirituality in his survey course of world religions. Out of these beginnings grew a course, more courses, a programme, and finally a department in 1976.[13] In a mining town with some thirty Indian reserves in the immediate area, it was difficult to deny Dr. Newbery's often repeated plea that "a much greater emphasis be given in the University to the education of Indian youth". Nevertheless, the initiative was not without its critics within Laurentian. Their sense of academic propriety was sometimes made uneasy by assertions such as the one that claimed that one of the purposes of Native Studies was to help "recognize and rectify the offenses of the past."[14]

Generally, then, the founders of Native Studies departments in Canadian universities were more senior ranking White academics who combined a scholarly interest in Aboriginal

affairs with a conviction that their own institutions had a responsibility to serve better the educational interests of Native peoples. Their efforts usually met with fairly warm receptions among surrounding Native communities. What was initially perhaps most surprising however, was the enthusiasm of non-Native students for Native Studies. At Trent University, for instance, the enrollment in the new department's introductory course in 1972 was 350, the vast majority of whom were not of Aboriginal ancestry. This relatively high rate of student participation enabled Native Studies at Trent and elsewhere to achieve quite quickly a reasonable degree of financial viability within the formula funding systems on which Canadian universities are generally run. That there was, and is such interest among non-Native students suggests the validity of Dr. Symons' often-repeated assertions about the hunger of Canadian students of all backgrounds for more understanding of this country's heritage. Their key role as participants in the development of Native Studies since its inception has almost assuredly contributed to a significant movement towards those educational goals articulated by Dr. Symons' as CASNP President in 1972.

It bears repeating, then, that Native Studies has engaged the close involvement, both as teachers and students, of many individuals who are not themselves Native. This reality has helped establish Native Studies as an academic endeavour whose legitimacy rests (ideally at least) on the integrity of its intellectual footings rather than on its special relationship with any particular ethnic communities. Nevertheless, given the intentions of the founders, Native Studies could not have advanced without the active participation of Native people in a variety of capacities. For as it has generally been understood, the mandate of Native Studies calls not only for the identification, analysis and dissemination of sound information about the Aboriginal peoples of the Americas. It includes as well the commitment to nurture the development of forms of research and pedagogy which spring from within Native traditions of learning and scholarship. An example of one such kind of academic initiative is the offering by accomplished Native speakers of university courses in Aboriginal languages. In a system of higher education where such instruction has been virtually unavailable in the past, the establishment of Native Studies has helped facilitate the bringing together of instructors and students who share an interest in renewing the Native linguistic forces which are uniquely indigenous to this land.

Trent University was fortunate to attract two particularly accomplished Aboriginal language teachers into the Native Studies Department. Professor Jacob E. Thomas was hired to give instruction in the Iroquoian tongues, one of the two major language families rooted in the Ontario area. A Cayuga speaker from Six Nations Reserve near Brantford, Professor Thomas is widely respected for his deep knowledge of the traditions of the longhouse people. Professor Fred Wheatley, an Ojibway speaker from Parry Island, Ontario, was drawn into the department as a teacher knowledgeable in the Algonkian dialects of the province. Through his refined use of Ojibway, together with his ability to discuss expansively the deeper philosophies capable of being expressed by the language, Professor Wheatley has earned his reputation for erudition. What made the appointments of Professors Thomas and Wheatley particularly interesting was that they both lacked any formal academic degrees. Their expertise had been gained rather in a context entirely outside of the avenues of university education. That this did not prevent the extension of academic recognition to these men's very real intellectual achievements, stands as a testament to the foresight and ingenuity practised by the founders of Trent Native Studies. The wisdom they showed

in taking the risk, and thereby incorporating in their university's curricula a kind of scholarship previously excluded from the halls of Canadian academia, has long since been vindicated by the quality of teaching extended by Professors Wheatley and Thomas.

Aside from Professors Wheatley and Thomas, however, who entered university teaching at a later stage of their lives, it has been the general rule that faculty members of Native Studies departments should possess appropriate credentials from recognized degree granting institutions. Hence, many of those recruited into the new academic positions created were younger Native people who in a variety of fashions combined their quest for deeper understanding of their own indigenous roots with the pursuit of higher level studies in the university system. At Trent, for instance, Professor Kidd handed over his leadership of Native Studies to Dr. Walter Currie, an Indian from Chatham with considerable involvement in the provincial education ministry's development of Northern Ontario school systems. Other Trent Native Studies appointments included Dr. Joseph Couture, an Alberta Metis whose doctorate is in Psychology, and Professor Harvey McCue, an early graduate from Native Studies who went on to pursue more advanced work in the area of Native education. Also joining the staff in the early years was Professor Marlene Castellano, a Mohawk from Tyendinaga Researve. Her particular teaching and research interest has concerned the delivery of social service systems to Native communities. The thrust of their work, together with that of Dr. Don McCaskill, a Euro-Canadian Sociologist whose dissertation concerned the relationship between Native people and the criminal justice system in Canada, have combined to give Native Studies at Trent University a decided orientation towards the social sciences.

Native Studies at Laurentian University, however, has developed along lines more closely associated with the humanities. Its own home within the larger Laurentian system is the University of Sudbury, whose charter actually dates back to 1913 when it was obtained by the Society of Jesus founders of a French-language classical college. This proved to be the seed out of which Laurentian itself eventually emerged in 1960, several years after the Jesuit holders of the 1913 charter had themselves begun to offer university-level courses. The leadership of the University of Sudbury has maintained its close association with the larger Roman Catholic community of Northern Ontario since, a fact which did not prevent them from offering Dr. Newbery, a United Church clergyman with extensive missionary experience in Trinidad, an institutional footing on which to found a Native Studies department. As noted, he laid the groundwork for it within the administrative area of Religious Studies. This established an orientation — an orientation stressing the philosophical and spiritual dimensions of Aboriginal experience in North America — which proved fundamental to the subsequent development of the Native Studies Department at Laurentian University of Sudbury.

Extremely instrumental in this evolution have been Professor James Dumont and his wife Edna Manitowabi from Manitoulin Island. Professor Dumont — a student of Dr. Newbery's — upon graduation from Laurentian, took a degree in theology at Emmanuel College in the University of Toronto. During his time in the city, however, where he and his future wife Edna became increasingly involved in the Anishinabe Institute on the eighteenth floor of the now legendary Rochdale College, Professor Dumont felt increasingly less drawn towards a career in the United Church. Instead, his conscience drew him to the study of his own spiritual inheritance in the Ojibway tradition. When he and Edna, a fluent Odawa speaker, were invited back to Sudbury by Dr. Newbery as teachers in

Native Studies, they found a context supportive of their continued efforts along these lines. As a result Edna began offering instruction in her Native language — classes often featuring philosophical discussions on the relationship between language and personal identity — while Professor Dumont developed a course on Native tradition and culture. This was to become a core offering of the future department.

Integrally involved with the genesis of Native Studies at Laurentian was Professor Nahum Kanhai. A Trindidadian whose association with Dr. Newbery goes back to the latter's missionary work in that country, Professor Kanhai is a Laurentian graduate with a master's degree from the Ontario Institute for Studies in Education. His teaching has focused particularly on the relationship between Native people and the legal system in Canada. As well, Professor Kanhai has brought to Native Studies a perspective affording prominence to the international dimension of Aboriginal affairs. Joining Professors Kanhai, Newbery and Dumont shortly following the emergence of Native Studies as a full-fledged department, was Dr. Thom Alcoze. A Cherokee from the United States, he was at the time completing his dissertation in Biology at Michigan State University. This expertise he brought to the establishment of a new Native Studies course. Entitled Man and Nature, its content involves a comparative approach to the study of Aboriginal and Western scientific views of ecology. Shortly following his arrival in Sudbury, Dr. Alcoze, who replaced Dr. Newbery as Chairman of Native Studies in the early 1980's, threw his enthusiasm into an initiative begun by Jim Dumont and Edna Manitowabi. Together they were among the prime movers in the establishment of a rural community east of Sudbury with a Native-ways primary school at its heart. The creative energies associated with this other pioneering pedagogical enterprise have tended to influence in a variety of informal ways the design of the Native Studies curriculum as it has developed at the University of Sudbury.

In the prairies other departments of Native Studies were also established during the mid-1970s. Professor Raoul McKay was attracted back to his home province from a teaching position at Trent to help in the founding of Native Studies at the University of Manitoba. At the University of Lethbridge a particularly dynamic group of young academics was assembled to undertake a similar initiative. In the establishment of Lethbridge Native American Studies, Dr. Menno Boldt played a similar role to that of Professors Kidd, Newbery and Corrigan. He was the more senior-ranking academic already in the system who proved willing and able to work with those in the community seeking to make the university serve better the educational needs of Native people. In Dr. Boldt's case it was two of his students, Roy Cunningham and Leroy Little Bear, who were instrumental in moving him in this direction. They returned to Lethbridge to become Professors in Native Studies after pursuing post-graduate work, the former in education and the latter in law at the University of Utah.

Professor Little Bear's consequent involvement in Aboriginal politics in the United States was one of the factors which has tended to orient the development of the curriculum of Native American Studies at Lethbridge more towards continentalist frames of reference. Indeed, this is an approach which almost inevitably follows from any close focus on the reality of Aboriginality in this land. Such a perspective tends to draw one to look beneath the boundary lines which presently outline national, state, provincial and municipal jurisdictions. Instead, one is required to envisage a map whose major features correspond more closely with the older patterns of Native social organization. And once the problem is posed in this way, of course — once the emphasis is placed on the fact of those living

indigenous nationhoods whose growth has been hampered by the overlay of colonial jurisdictions upon them — the questions raised are not specific to the Americas. All over the globe peoples are striving to regain a better sense of their indigenous heritages so that they can develop societies consistent with the most deeply-rooted values of their local cultures. The struggle of the Basques to achieve statehood is a good European example of this international phenomenon. In the Department of Native American Studies at Lethbridge, such a perspective too has been afforded prominence. The expression used to identify the understanding associated with this approach is "the fourth world" — the world of indigenous peoples seeking forms of development consistent with the values of their Aboriginal inheritance.[15] Playing a significant role in the articulation of this fourth world perspective, first at the National Indian Brotherhood where she worked closely with its former President George Manuel and then as a Professor of Native American Studies at the University of Lethbridge, is Professor Marie Marule.

At universities in Ontario, Manitoba and Alberta, then, Native Studies units have been established on departmental footings. In Saskatchewan local circumstances have resulted in another form of development. In that province, where Native people constitute more than a tenth of the overall population, there is a particularly strong Indian organization. Unlike Ontario, for instance, where there are four major organizations representing the registered Indians, in Saskatchewan there is only one. Accordingly, the Federation of Saskatchewan Indians (whose growth over the years has been encouraged by a succession of relatively friendly CCF and NDP governments)[16] is perhaps the most powerful and cohesive of the many regional Aboriginal organizations which exist in Canada. In 1975, the FSI reached an agreement with the University of Regina to create within that institution the Saskatchewan Indian Federated College. With such an effective Indian political force behind it, the SIFC has grown quickly. Unlike other Native Studies departments in Canada, however, where teaching activities have been generally directed towards student populations at large, the SIFC has from its inception involved itself primarily with the education of Indian students from member bands of the FSI. And the education thus extended has tended to place emphasis on stimulating the development of practical career skills among Indians in fields such as education, social work and administration.[17]

Given its concentration of human and other resources, the SIFC assumed a position of national importance in the area of Indian education. It has assembled an excellent research library, for instance, the seed of which was the extensive collection that had originally been drawn together by the old Indian-Eskimo Association, or CASNP as it was re-named after 1972.[18] One of the departments within the SIFC is titled Indian Studies. Professor Blair Stonechild, who went on in the 1980s to become the founding President of the Canadian Indian/Native Studies Association, is closely associated with its growth and development. He brought to his position in the SIFC important experience as Assistant Director of the short-lived but seminal Manitou College in Quebec. In establishing Indian Studies at the University of Regina, Professor Stonechild and his colleagues have faced both the advantages and the difficulties associated with being so closely connected to a strong political organization. On the one hand, their pedagogical activities have drawn strength and relevance from the direct involvement of so many Native communities in the life of their university. On the other, there have been the predictable stresses between the need of the professorate for academic freedom and the need of the SIFC administration to maintain good relations with its governors in the Federation of Saskatchewan Indian Nations. An area of particular sensitivity in this regard has been the position of the College

on how it draws distinctions between registered Indians, so-called non-status Indians, and Metis. Certainly those departments of Native Studies which are not so closely associated with any particular Aboriginal associations have had far less difficulty in placing the many important issues associated with the legal categorization of Aboriginal peoples, in a reasonably disinterested academic context.

Native Studies departments in Canada developed during a period when a growing number of Aboriginal people were being drawn into the process of national politics as never before. Certainly their increased involvement in university work, and in Native Studies in particular, was one factor in this development. But the primary driving force behind the politicization of Aboriginal affairs was the action of Prime Minister Pierre Elliot Trudeau. Emerging out of the ideological battleground associated with Quebec's then-tumultuous identity crisis, Trudeau came to power intent on checking the force of separatist nationalism that had been engaging the imaginations of so many in his home province. Insistence on the legal equality of all individuals in Canada was Trudeau's means of answering the assertion of special status for Quebec. This view of the country caused him to take aim shortly after becoming Prime Minister at that old body of treaties, laws and administrative units which determined and executed the Crown's Indian policy. In a document soon termed the White Paper, the Trudeau government in 1969 set out its intent to draw to an end Indian treaties, the Indian Act and the Department of Indian Affairs. The declared objective was to establish a basis for the future legal equality of all Indians with regular Canadian citizens.[19]

What the White Paper did for Indians was much like what Lord Durham's report had done over a century earlier for French-speaking Canadiens in recommending their eventual assimilation. Native people from coast to coast quickly perceived that their special place in Canadian society was no longer assured. As antiquated and ineffective as the squeaky old machinery of Indian policy had become since the time of the treaties, there was almost universal rejection by the Indians of the idea of doing away with it altogether. In making their case, Native people throughout Canada were forced to become more organized. They had been served notice that unless they became more directly involved in the larger political processes in Canada — unless they articulated clearly and in an orchestrated fashion what they viewed as their rights and their proper place in the evolving Canadian federation — others would simply legislate away their special legal status. There was a good deal of irony, then, in the new reality imposed upon them in the aftermath of the White Paper. They were in a sense being required to penetrate more deeply the institutions and the mores of Euro-Canadian society so as to defend a place for their posterity as members of distinctive Native communities. In order to preserve a homeland, and in order to develop many of the new kinds of tools needed for cultural survival in a rapidly changing world, fresh approaches were called for.

Much of the Native leadership in Canada quickly seized upon education as the most essential force in the determination of their people's future. One of the National Indian Brotherhood's major responses to the White Paper, for instance, was a document published in 1972 entitled *Indian Control of Indian Education*. It set out the need of Native communities to have a greater role in determining the form and the content of the pedagogy extended to the rising generations of Native people. Control of education was described as the most effective means through which Native communities could begin to regain a determining influence over their own destinies. In the person of the young Harold Cardinal, a particularly

attractive model was shown of a highly educated Indian well rooted in his own traditions while at the same time able to exert power on the levers of influence in Euro-Canadian society. While still in his early twenties, Cardinal advanced quickly through a succession of posts which took him from Associate Secretary of the Canadian Union of Students to the President of the Indian Association of Alberta. Enroute he published in 1969 *The Unjust Society*, a scathing attack on Trudeau's White Paper and the century of betrayal which had preceded it. [20]

The appearance of *The Unjust Society* by the brilliant, angry Harold Cardinal served as a demonstration to younger Aboriginal people of how the tools of research, writing and publication — exactly those activities which feature so prominently in university work — could be used to Native advantage. Similarly, the activism associated with the drafting and publication of *Indian Control of Indian Education*, had the effect of stimulating increased interest in objectives that could be brought closer by more effective Native involvement in the design of university curricula. Accordingly, both these publications were among the most important in setting the ideological tone during the early years of development in the field of Native Studies. In these academic units a small but growing number of Native people found a footing from which they would at once broaden their scope of understanding about their own Indigenous cultures and at the same time become more familiar with the legitimizing procedures of Euro-Canadian society.

Clearly, then, the founding of Native Studies coincided roughly with the onset of a new era which was to see Aboriginal groups seeking to assert greater degrees of political power, especially over the design of educational programmes for their own people. This pattern tended to be yet more pronounced in the United States. In 1969 at the University of California at Berkeley, for instance, Indians were among those "Third World" strikers who had occupied a building to assert what they viewed as their educational rights. As a direct result of the protest, the Berkeley Department of Ethnic Studies was established, where Native American Studies was founded alongside Afro-American Studies, Chicano Studies and Asian-American Studies. This Berkeley response, of course, and the other similar initiatives undertaken at universities both in the USA and Canada, must ultimately be viewed as only aspects of a many-faceted surge of reformist energy which swept through the Western world during the searching times of the mid to late 1960s and the early 1970s. In the heady atmosphere of those days, virtually all forms of personal and collective liberation were prone to received broadly based forms of popular support. And for so many of these liberation movements, education seemed to present one of the most promising keys of entry to the promised land. Accordingly, the intellectual climate which stimulated the development of Native Studies nurtured also the growth of fields like Women's Studies, Working Class Studies and Black Studies. To the young academics who were largely the driving force behind such academic innovations, the ideal was often, implicitly at least, to redress some of the injustices of the past by advancing knowledge of the dynamics of those oppressive forces which have worked to hold down history's apparent losers.

It cannot be doubted, therefore, that a variety of forms of political activism have sought expression in the developing field of Native Studies.[22] For some this has been attractive; it has imbued the study with an engaging vitality and a lively contemporary "relevance". For others, however, the overtly political dimension of Native Studies has aroused suspicion. It has made the field appear sometimes more as a platform for the dissemination of biased opinion than as a site for sound scholarly activity. Such concern, if taken to extremes,

can become overblown. There are many historical occasions which, when looked at in retrospect, reveal a healthy concurrence between a genuine political movement and the advancement of legitimate academic enterprise. To cite two rather monumental examples: the Renaissance and the Enlightenment were certainly movements where political and scholarly energies met with overall ennobling effects.

Nevertheless, the charge that the practitioners of Native Studies have sometimes allowed their analysis to run more towards polemics and less towards balanced assessment of the full array of forces at work in the unfolding evolution of Aboriginal affairs in the Americas is not completely without foundation. Thus, while maintaining and developing links with living Native communities must remain an essential facet of the field's advancement, so too must countervailing forces be encouraged to help establish some degree of analytic detachment between Native Studies personnel and the subjects of their research and teaching. Indeed, what is probably now most required if Native Studies is to mature and adapt, is a higher valuation of academic approaches to Aboriginal affairs which can analytically situate the interplay of those ideologies and interests that drive Native politics.[23] The fruits of this kind of study, it is maintained here, are just those that in the final analysis will best serve the interests of the university, of Native communities and of the architects and administrators of the increasingly complex public policy interfaces between Aboriginal peoples and others in Canada.

While movement in this direction has far yet to go, there are some important signs that Native Studies is developing beyond its earlier forms of activist expression towards more thoroughly considered and reflective varieties of academic articulation. Indication of this is to be found, for instance, in the usually rigorous approach of the contributors to *The Canadian Journal of Native Studies*, a scholarly vehicle launched in 1981 largely as a result of the efforts of faculty members at Brandon University. Encouraging too is the quality of the two volume publication by University of Lethbridge faculty members, of proceedings from conferences which brought together especially diverse and distinguished groups of experts on Aboriginal rights.[24] As a rule, however, Native Studies faculty have not yet produced the really authoritative sorts of monographs and texts which will be required if the field is ever to exact more complete recognition from the larger academic community in Canada. For the time being, the really important book-length studies in the country on Native Studies topics, like Bruce Trigger's *Natives and Newcomers*,[25] John Webster Grant's *Moon of Wintertime*[26] and Sally Weaver's *Making Canadian Indian Policy*, are the products of academic toil by scholars firmly rooted in the more traditional university disciplines.[28]

Acting as vehicles to engage the involvement of Native people in many aspects of university affairs is one of the most significant contributions which Native Studies departments have made thus far to their host institutions and to Canadian academia as a whole. That Aboriginal people had been almost completely absent from the halls of Euro-Canada's most favoured centres of higher education prior to 1969, does the country no honour. And without doubt the intellectual life of Canada was poorer for it. In addressing this issue squarely, and in working to open universities to the fresh ideas and approaches of those whose cultures have the most deep roots in this land, the founders of Native Studies took on a historic task. Their endeavours can now be seen as a reflection that the Canadian people generally were ready to begin crossing a new threshold in the quest for national self-awareness and national reconciliation. In answering so favourably the invitations to

join in the establishment of Native Studies, the potential and accomplished Native scholars who took on the challenge of the universities often did so largely out of a patriotic desire to serve the interests of their own Aboriginal communities. It remains to be seen whether it will be possible for them to find lasting harmonious balances between the objectives of meeting the educational needs of their own people, the needs of the student population generally, and the requirements of the larger university system in which their academic posts are situated. Hard choices will eventually have to be made. If appropriate courses can be chosen, however, ample intellectual and social rewards must surely yet flow from this important new departure in Canadian higher education.

Endnotes

1. This great discrepancy is discussed in the submission tabled by the Native Council of Canada in the 1983 First Ministers Conference on Aboriginal Rights.
2. These numbers are extrapolated from 1981 census figures, as given in the federal government's press information kit that was tabled at the 1983 First Ministers Conference on Aboriginal Rights. The number of Indians given, makes ample allowance for the relatively fast increase of those with this registered status since 1985. Bill C-31 then set up the mechanism whereby many Indian women who had formerly lost their registered status, could be re-instated. For a more detailed overview of Native demography see James S. Frideres, Native People in Canada: Contemporary Conflicts, 2nd Edition (Scarborough: Prentice-Hall Canada, 1983) pp. 130–186.
3. For a recent overview of historical writing on the Canadian North, see K.S. Coates and W.R. Morrison, "Northern Visions: Recent Writing in Northern Canadian History, Manitoba History, Autumn, 1985, pp. 2–9.
4. These programmes are outlined in Robert S. Allen, Native Studies in Canada: A Research Guide (Ottawa: Indian and Northern Affairs Canada, 1984)
5. Ibid.
6. This view of Native Studies is different from that of Don McCaskill and M.J. Castellano. In an unpublished paper given in 1979 at the Canadian Learned Societies Conference in Saskatoon, their presentation was entitled: "Native Studies: An Emerging Discipline".
7. The history of Trent Native Studies is outlined in Don N. McCaskill and H.A. McCue, "Native Studies at Trent University", unpublished paper presented to the symposium on North American Native Studies: Their Programmes and Contributions, at the XLI International Congress of Americanists, Mexico City, September, 1974. This paper is available on request from Trent Native Studies.
8. An abridged version of To Know Ourselves is published in paperback. See The Symons Report (Toronto: McClelland and Stewart, 1976). A very critical assessment of the legacy of the report is outlined by David J. Bercuson, Robert Bothwell and J.L. Granatstein in The Great Brain Robbery: Canada's Universities on the Road to Ruin (Toronto: McClelland and Stewart, 1984) pp. 130–146.
9. On the history of the IEA and CASNP, see Sally M. Weaver, Making Canadian Indian Policy, The Hidden Agenda, 1968–1970 (Toronto: University of Toronto Press, 1981) pp. 12, 42–43; J. Rick Ponting and Roger Gibbins, Out of Irrelevance: A socio-political introduction to Indian Affairs in Canada (Toronto: Butterworths, 1980) pp. 298–309. Ponting and Gibbins conclude their history by describing the death of CASNP in the late 1970s. Not only did CASNP not die, however, but now in the late 1980s its membership is growing. The discrepancy awaits Ponting's and Gibbins' scholarly attention.

10. Indian-Eskimo Association Bulletin, Vol. 13, No. 3, July, 1972, p. 2.
11. Professor Kidd's publications include: The Excavation of St. Marie I (Toronto: University of Toronto Press, 1949); Canadians of Long Ago: The Story of the Canadian Indian (Toronto: Longman, Canada, 1951); with Selwyn Dewdney, Indian Rock Paintings of the Great Lakes (Toronto: University of Toronto Press, 1962); with Martha Ann Kidd, "A Classification System for Glass Beads for the Use of Field Archaeologists," in Canadian Historical Sites: Occasional Papers in Archaeology and History, No. 1, Ottawa, Dept. of Indian and Northern Affairs, 1970, pp. 45–89; Blackfoot Ethnography, Archaeological Survey of Alberta Manuscript Series No. 8 (Edmonton: Alberta Culture and Historical Resources Division) This publication is a reprint of his 1937 M.A. thesis, written for the University of Toronto.
12. See Michael Blanar, "Native Studies at Brandon: A History and More", The Canadian Journal of Native Studies, Vol. 1, 1981, pp. 165–177.
13. Native Studies at Laurentian was afforded departmental status largely as a result of an external review conducted by Anthropologist Sally M. Weaver and Psychologist Joseph Couture. Their report is available on request from Laurentian Native Studies.
14. The phrases are taken from a brief made by Dr. Newbery to the Laurentian Senate's Academic Planning Committee in May of 1973.
15. See George Manuel and Michael Posluns, The Fourth World: An Indian Reality (Toronto: Collier-Macmillan, 1974)
16. For the background of Native politics in Saskatchewan during the twentieth century, see Murray Dobbin, The One-And-A-Half-Men: The Story of Jim Brady and Malcolm Norris, Metis Patriots of the Twentieth Century (Vancouver: New Star Books, 1981); Norma Sluman and Jean Goodwill, John Tootoosis, Biography of a Cree Leader (Ottawa: Golden Dog Press, 1982)
17. See The Saskatchewan Federated College ten year anniversary report. This is available from SIFC Information services, 127 College West, University of Regina, Regina Saskatchewan, S4S 0A2.
18. A full listing of the extensive holdings of the SIFC is available from the address listed above.
19. The White Paper is officially described as follows: Canada, Department of Indian Affairs and Northern Development, Statement of the Government of Canada on Indian Policy, Ottawa, 1969. See also Sally M. Weaver, Making Canadian Indian Policy: Indian Chiefs of Alberta, Citizens Plus (Edmonton, 1969); Tony Hall "Home Ground: The Struggle for Native Rights during the Trudeau Years", Horizon Canada, Vol. 4, No. 38, 1985, pp. 902–907.
20. Harold Cardinal, The Unjust Society: The Tragedy of Canada's Indians (Edmonton: Hurtig, 1969)
21. See Clara Sue Kidwell, "Native American Studies: Academic Concerns and Community Service", American Indian Culture and Research Journal, Vol. 2, Nos. 3 and 4, 1978, p. 4. For a survey of more recent developments in the area of Indian-controlled initiatives in higher education in the U.S.A., see Norman T. Oppelt, "The Tribally Controlled Colleges in the 1980s: Higher Education's Best Kept Secret", in ibid, Vol. 8, No. 4, 1984, pp. 27–43.
22. See John A. Price, "Native Studies versus the Academic Establishment", The Canadian Journal of Native Studies, Vol. 1, 1981, pp. 193–201.
23. A similar case was presented by Wilcomb E. Washburn, of the Smithsonian Institution, in assessing the progress of American Indian Studies in the United States. He lamented that in some situations, American Indian Studies departments had become

extremely insular. Ideas were sometimes judged in such centres, more on the basis of the racial background of their source, rather than by their inherent quality. What would best serve American Indian Studies, asserts Washburn, is an active involvement and dialogue with the whole range of academic disciplines. This dialogue, he continues, is the great prerequisite for the successful and fruitful integration of American Indian Studies into the wider university community. See Washburn, "American Indian Studies: A Status Report", American Quarterly, Vol. 27, No. 3, August, 1975, pp. 263–274. Washburn's ideas were part of a lively discussion on the possibilities for a future M.A. programme in American Indian Studies at the University of California in Los Angeles. The transcript of this discussion is published in American Indian Culture and Research journal, Vol. 2, Nos. 3 and 4, 1978, pp. 28–46. For similar reflections on the development of Black Studies in the United States, see Kenny J. Williams, "Down by One is Still Losing: The Black Studies Syndrome", Change, October, 1981, pp. 30–37.

24. Leroy Little Bear, Menno Boldt, J. Anthony Long, eds., Pathways to Self-Determination: Canadian Indians and the Canadian State (Toronto: University of Toronto Press, 1984); Bolt, Long and Little Bear, eds., The Quest for Justice: Aboriginal Peoples and Aboriginal Rights (Toronto: University of Toronto Press, 1985)
25. Bruce G. Trigger, Natives and Newcomers: Canada's "Heroic Age" Reconsidered (Kingston: McGill-Queen's University Press, 1985)
26. John Webster Grant, Moon of Wintertime: Missionaries and the Indians of Canada in Encounter since 1534 (Toronto: University of Toronto Press, 1984).
27. For full reference see note 9.
28. For bibliographical discussions on the historiography of Aboriginal affairs, see James W. St. G. Walker, "The Indian in Canadian Historical Writing, 1972–1982", in Ian A.L. Getty and Antoine S. Lussier, eds., As Long as the Sun Shines and Water Flows: A Reader in Canadian Native Studies (Vancouver: University of British Columbia Press, 1983) pp. 340–361; Bruce G. Trigger, "The Historians' Indian: Native Americans in Canadian Historical Writing from Charlevoix to the Present", The Canadian Historical Review, Vol. 67, No. 3, September, 1986, pp. 315–342.

* A major source of the information given in this paper, especially in section II, is my conversations with a number of individuals personally involved in the genesis of Native Studies. Therefore, I would like to acknowledge and thank the following people for the contribution they have made: Thom Alcoze, Roy Cunningham, Helen Devereux, James Dumont, Nahum Kanhai, Ken Kidd, Laurent Larouche, Don McCaskill, Ed Newbery, Art Solomon, Blair Stonechild. The responsibility for the interpretations given, and for any errors made, of course, remain entirely my own.

DEVELOPING LITERARY PUBLISHING IN NORTHERN ONTARIO

John Flood
Collège Universitaire de Hearst

Abstract: In a vast sparsely-populated region such as Northern Ontario it is not unusual to find that culture is imported. In this paper, Professor Flood demonstrates that literary culture can be nurtured and exploited in a northern region if certain key ingredients are allowed to co-exist. It is first necessary to regard publishing as a process in which editorial and managerial decisions are made both for cultural and industrial reasons. Lobbying the business and banking communities, for example, should not be seen as contrary to cultural objectives but as complementary to them. Although literary publishing in the North is small business, a literature professor with an entrepreneurial aptitude can transform it into a viable enterprise.

Résumé: On découvre souvent que, dans une région vaste et sous-peuplée comme le Nord-est de l'Ontario, les objets culturels proviennent de l'extérieur. Dans sa communication, l'auteur prouve qu'il est possible de développer une culture littéraire et d'en exploiter les oeuvres dans une région nordique, pour peu qu'on réunisse les éléments indispensables. Il est, en premier lieu, nécessaire de considérer l'édition comme un processus au cours duquel on se fonde sur des considérations tant culturelles qu'industrielles pour prendre des décisions en matière de rédaction et de gestion. Par exemple, on ne devrait pas considérer les pressions auprès des milieux d'affaires et de banque comme contraires aux objectifs culturels, mais plutôt comme leur adjuvant. Bien que dans le Nord canadien l'édition d'oeuvres littéraires soit une entreprise de faible envergure, le professeur de littérature à l'esprit entreprenant peut en faire une activité viable.

The title of my paper was originally "Literary Publishing in Northern Ontario," but I decided that adding the progressive term, 'Developing,' would more accurately reflect the condition of literary publishing in a large region.

The questions raised by the revised title are these: (1) What is involved in developing literary publishing in Northern Ontario? (2) Is literary publishing distinguishable from other kinds of publishing? (3) Is publishing in Northern Ontario different from publishing in other regions, especially northern regions of the country? Although not all the questions will be answered in this short paper, I will propose strategies pertaining to their broader implications.

Developing literary publishing in Northern Ontario is an activity that involves both theoretical and applied skills: a professor's skills at literary criticism and an entrepreneur's skills at financial planning. If their two activity curves, the professor's and the entrepreneur's, were plotted on a graph, we would see that the point at which they intersect is where the potential for literary publishing occurs. At this point we should also be able

to understand more about how the word 'developing' applies to literary publishing. Its usage here implies that our professor and entrepreneur already share common interests predicated on similar responses to the northern region itself.

The responsibility of the professor is to inquire into the *history* of Northern Ontario Literature — who the important writers have been; what they wrote; how they influenced other writers and their time; in short, to establish the nature of the corpus which is available to us as scholars for research. The professor is also responsible for assessing and analyzing the condition of *contemporary* authors and the corpus that is presently being written. Situating the historical and contemporary literatures in a corpus is necessary for the professor to justify their study — both of the genre itself and of examples contained therein.

Once informed about the nature of Northern Ontario Literature, the professor can provide scholarly insight about its future — what trends and patterns to look for; what topics of study to emphasize; which authors to follow.

It is at this stage in the graph that if the professor also possesses entrepreneurial skills, the second line will traverse the first and take off into the dazzling world of business — certainly an unusual place to find a literature professor. Or is it?

Even just a short list would show that literature professors have historically been at the center of literary publishing in Canada: Fred Cogswell (Fiddlehead Books, University of New Brunswick); Dave Arnason (Turnstone Press, University of Manitoba); Glen Sorestad (Thistledown Press, University of Saskatoon); Stan Dragland and James Reaney (*Brick* and *Alphabet*, both from University of Western Ontario); Frank Davey (*Open Letter*, York University). Such a list helps to dispel the false notion that literature professors know only the cheque-cashing, mortgage-paying, pension-building side of financial management. As an aside, one should observe that most of the publishers in this list have developed their publishing programs with distinct regional biases.

One of the things that happens when professors become entrepreneurs is that they momentarily stop regarding the corpus as a product that affects them and they begin to treat it as a *process* which they can affect. When the publishing process begins (ie. getting the product to the end user, the reader) the definition of the word 'developing' changes — from perceiving the job to be one devoted exclusively to researching and analyzing the corpus to one that entails nurturing and exploiting the market.

As manager, the publisher exploits markets — undertaking publicity, promotion, distribution and fulfillment of authors' books. There must also be time for direction of production — including designing style and format of books and journals; choosing typography, stock, and pressrun; and arranging financing.

As editor, the publisher nurtures the authors — reading, selecting, revising and criticizing manuscript materials; compiling bibliographies and indices; securing copyrights and permissions; and negotiating contracts and ensuring payment of advances and royalties.

For literary publishers to nurture authors in the north they must say to their authors something like this: "Look here, you are a writer not unlike professional writers elsewhere; you have something to say and a unique way of saying it. Take yourself seriously and

write; keep writing, and write some more. Don't give up." Publishers *must* say this and more in order to foster the authors' own self worth and sense of security. "To be a serious writer in a region is to regard neither yourself as provincial nor your craft as inferior."

Thus, a northern literary publisher should be able to extract from northern authors (such as Ken Strange, Joan Skelton, James R. Stevens, or Paulette Jiles, to name a few) manuscripts whose subjects, whether or not they pertain to the north, are nonetheless first-rate literature. I suspect that other literary publishers relate similarly to their northern authors — Oberon Press with Frank Paci (Sault Ste Marie) or Prise de Parole with Doric Germain (Hearst), for example.

Not all northern literature is written by northern authors, however. Therefore the question of an author's residence should not be given much negative consideration. We do not deny the significant contribution to Northern Ontario Literature by authors such as Duncan Campbell Scott, Archibald Lampman, Herman Voaden, or Marian Engel merely because they were not permanent residents of the north. Nor is it fair to ignore their writing because it reflects what some might derogatively describe as a touristic approach to the land. Of course the northern setting is important to these authors, and of course it has contributed to the evolution of their creative writing. We might wonder, by way of comparison, where Canadian art would be if the influence of Northern Ontario were taken away from artists such as Lawren Harris, J.E.H. MacDonald, and their cohort. Canada's reputation as founder of the Northern School of Art has emanated precisely because we acknowledge the affect this solemn land has had on artists regardless of their residency.

Nurtured authors provide the publisher with a compendium of materials that to the professor further verifies the existence of the corpus. These materials can be, and very often are, published as monographs and marketed as individual items within a larger tradelist. The publisher/professor should also see the opportunity for compiling an anthology to be used in the classroom and subsequently for nurturing a whole new generation of aware and informed readers.

Indeed, the task of developing an anthology of northern writing has been one of my main concerns since 1980. Having assembled a team of editors and begun to select appropriate materials, I have clearly learned that since as an educational tool the anthology must be accessible to both secondary and post-secondary levels of education, its packaging will have to involve two distinctly separate volumes — in one the writing will be 'screened' for secondary schools (it might also contain a teachers' guide); in the other the writing will be 'enriched' for post-secondary use.

Another responsibility of the publisher is to reach the non-educational, non-textbook market. To do so, the publisher must establish a plan that follows existing rules of the small press trade. This will help to rationalize and formalize assumptions made by the otherwise inexperienced professor. In wanting to maximize potential growth, the publisher must cast an eye, a very far-sighted eye, at the ultimate measure of success — the bottom line.

Not unlike scholarly publishing, literary publishing is also *small* publishing and must therefore depend on the generosity of funding agencies and arts councils to ensure financial stability. A northern literary publisher should make no apologies for being awarded cultural grants. Yet even this 'free' money is not enough to smooth out day to day operations.

Thus it is quite disheartening to hear a bank manager say that Head Office says that without grants your publishing business would be bankrupt. That pretty well defines the banks' attitude toward all cultural industries in this country, including dance, theatre, music, and literary publishing. With just one minor alteration in the spelling of the word 'hinterland,' a word commonly used by non-northern exploiters of the north, we can see how the banks can also quickly turn us into a 'hinderland.'

Two things must be done to overcome such reticence and ignorance — first, to lobby the banking and business communities to inform them that as a cultural industry publishing is an asset not a liability. They must be informed that not to take a risk would be to abort the creative genius of our writers, as well as to close the doors on the developing expectations of our readers. The end result would be nothing less than cultural suicide.

Secondly, the northern literary publisher who is already supported through deficit formula funding and block grants for sales and marketing *must* also lobby the larger governmental ministries and departments — what I would call self-interest ministries — for entrance into the more lucrative programs. The northern literary publisher must explore all possibilities to grow into a viable business environment and thus to compete head to head with the larger (and commercial) publishing houses in the south.

The incentive for long term financing — through forgivable or guaranteed loans, for example — would remove the cottage industry stigma that has unjustly attached itself to all serious literary publishing. Even simple amenities such as adequate office and warehouse space, trained personnel, and updated computer technology would enable the literary publisher to deliver the literary product more effficiently to the consumer.

For the most part, despite operating out of garages and basements, literary presses are already quite efficient in capitalizing on their sales strategies. Most have annual sales of $75,000 to $100,000, and the average rate of return of unsold books is approximately only 5% of copies shipped. Large publishers, that is those with sales in excess of $1 million, generally have returns of 30% or more.

Most literary publishers already have substantial equity — thousands of dollars in my case — in their companies. All that is needed to drive their entrepreneurial blip beyond the banks' definition of success is for governments and other institutions to meet the publisher and professor at the crossroad.

Developing Northern Ontario Literature in this manner is not an easy job. It is one that must reconcile the cultural and humanistic paradoxes of nurturing authors and readers *with* the financial responsibilities of market exploitation. The literary publisher/professor must be prepared to understand and to encourage this dual identity — a goal that also must be regarded as attainable.

PROBLEMS ASSOCIATED WITH RESEARCH IN BOREAL AND ARCTIC ECOSYSTEMS

Frank F. Mallory
Department of Biology, Laurentian University

Abstract: Researchers working in arctic and boreal ecosystems face many problems not experienced by their colleagues working in the south. Transportation is expensive, unreliable, dangerous and often non-existent. Accommodation is often difficult to find throughout most of the year due to the acute housing shortage. However, during June and July, vacant teachers' houses may be obtained for free, if one is willing to do a few housekeeping chores. Laboratory facilities are increasing in number but their operation is frequently ephemeral and tenuous due to underfunding. Government personnel tend to turnover every two years, which makes cooperative research difficult, and native northerners are often suspicious of research as they seldom see the results, and if they do, it is frequently in the form of increased restrictions. The recent federal government's decision to tie research to industrial development will also reduce the funds available for northern research, as very few industries exist in this region.

Résumé: Les chercheurs effectuant des travaux sur les écosystèmes arctiques et médionordiques doivent surmonter bien des difficultés, que ne subissent pas leurs collègues travaillant dans le Sud. Les transports sont coûteux, peu fiables, dangereux et parfois inexistants. En raison du manque de logements, il est difficile d'en trouver pendant la plus grande partie de l'année. En juin et juillet, par contre, il est possible d'occuper gratuitement les maisons laissées vacantes par les enseignants, à condition de faire quelque ménage. Les laboratoires deviennent un peu plus nombreux, mais leur utilisation est transitoire et restreinte, en raison du manque de crédits. Les chercheurs du secteur public sont souvent remplacés tous les deux ans, ce qui rend la recherche concertée difficile. Les Nord-Canadiens, voyant rarement les résultats de la recherche, restent méfiants, d'autant qu'elles se traduisent parfois par des restrictions supplémentaires à leurs activités. La décision récente prise par le gouvernement fédéral, en vue de lier la recherche au développement industriel, entraînera une réduction des crédits destinés à la recherche nordique, car bien peu d'industries sont installées dans le Nord.

As a wildlife biologist, who has spent the last 15 years working in boreal and arctic ecosystems, I feel reasonably qualified to comment on some of the problems one may encounter doing research in Canada's last two frontiers. These comments are intended to alert new researchers entering the field, and to identify areas where parties concerned with the North can work together with the hope of reducing these difficulties.

Transportation

Most Canadians do not realize that Canada covers a greater distance north to south, than it does east to west. Throughout most of this north-south expanse, air travel is the only

form of transportation available and it is expensive and unreliable due to weather. A few years ago, while flying up the west coast of Hudson Bay to Eskimo Point, N.W.T., the plane was diverted to Rankin Inlet due to fog, where we slept on the floor of the wildlife office for a week. Although one quarter of my field season had been lost, I felt lucky to have a friend in town, as the hotel at that time was charging $120.00 per night. The cost of flying north and south is also very expensive. A return fare for a single person flying from Sudbury to Eskimo Point, N.W.T. is usually in excess of $1,000.00. Eskimo Point being in the "low arctic", just above the treeline, is not really that far. In contrast, one can fly from Sudbury to Vancouver for approximately $450.00 or less.

Another major problem is that northern routes are not within the jurisdiction of single carriers. Travellers moving east and west can board one carrier (example Air Canada) and fly across the country, whereas travellers moving north-south most often have to change carriers many times. For example, in travelling from Sudbury to Eskimo Point, one must take Nordair to Winnipeg, Pacific Western to Churchill, and Calm Air to Eskimo Point. Returning is even more difficult due to connections; Calm Air to Churchill, Pacific Western to Winnipeg, Air Canada to Toronto, and Air Ontario to Sudbury. This is especially difficult for biologists who are carrying live animals or perishable samples which require immediate attention. Every time you transfer between carriers, you increase the chance of your baggage ending up in Timbuktu and literally perishing forever. Live animals pose a special problem as each carrier places a surcharge on each animal, in addition to the regular transport charge. For example, we brought six arctic fox pups south to the University last year and had to pay the surcharge four times for each animal. If we had taken these animals across Canada on one carrier, the surcharge would only have been paid once.

Preserved material poses another problem for northern researchers. Few northern communities have access to dry ice, liquid nitrogen or formalin, and as a result these materials have to be flown in and out. All are classified as restricted articles under the dangerous goods act and each year the restrictions and paper work associated with these items increases. The most recent rumour is that these items will soon be banned altogether from air transport, which is fine for the south, but will have dire consequences for northern research. In addition, there is usually only one person trained to handle such goods at each airport, and if he takes holidays you are out of luck. Goods can not even be placed in temporary cold storage as most Canadian airports, even the major ones (example Vancouver and Winnipeg) do not have freezer facilities.

This past summer, I thought I would be clever and take the train to Churchill (a three day ride). This I hoped would allow me to avoid the usual hassle with my liquid nitrogen cannister, which I use to freeze tissues for electrophoresis. Half way to Churchill, I was paged through the train and told that me and my liquid nitrogen cannister would be thrown off in Dryden. Apparently, the conductor correlated liquid nitrogen with nitroglycerine and the bomb. As we pulled into Dryden, the OPP, RCMP, and bomb squad were there with sabers drawn. Fortunately, one of the policemen knew that liquid nitrogen was relatively harmless, and was commonly carried around by farmers in the backs of pickup trucks to collect bull semen for artificial insemination. However, after things calmed down, the train was still delayed a half hour as we tried to convince the Ministry of Transport in Ottawa that we had no intention of blowing up the train.

Once you reach the north, transportation is still a problem. There are few roads and the terrain is often difficult to move over. All-terrain cycles, skidoos and/or canoes are absolutely essential. If you intend to spend more than one season in the area, these are often cheaper purchased than rented. Although granting bodies most often require that you rent this type of equipment, such a practise can quickly eat up your already impoverished research grant. The solution is to be creative.

Accommodation

With few exceptions, all northern communities in Canada have an acute housing shortage. This means that there is very little room for southern researchers looking for accommodation. The reason for this shortage is quite simple. As one of my northern friends informed me, with a gleam in his eye, "Eskimo Point has the highest birth rate in Canada", and he emphasized "possibly the world". As a result, there are not a lot of houses or facilities, sitting around and waiting for you to arrive. The hotels which charge between $120.00 and $140.00 per night are not much of an alternative for poor researchers either. So, you can tent, which is fine until you need your first bath, or you can move in with a local family which is still commonly done, although there is increased resistance to strange southerners who suddenly appear and expect to be greeted with open arms. In the N.W.T., accommodation is especially difficult to obtain from mid August to the end of May. The school year ends with May and most teachers leave on the first plane south, leaving behind their subsidized government house. These houses are very comfortable and often available to individuals willing to "house sit" (water plants, look after dogs, clean etc.). This solution has worked very well for me during the past 7 years, but only solves the problem for June and July. Researchers wishing to take advantage of this type of arrangement should phone the principal of the school in the community concerned. Although these arrangements are often free, wise researchers send a gift (payment in kind) usually at Christmas or they may not be invited back the next year. Unfortunately, "payment in kind" is not a legitimate expense on most grants. Churches will also often take in people for short durations of time.

Laboratory facilities

Although the number of research facilities in the North is continually increasing (Canada's Northern Stations; ACUNS Occasional Publication No. 13, 1986) their operation is often ephemeral and tenuous due to continual changes in operating funding provided to individual researchers. Indeed, most researchers cannot afford to maintain these centers on the grants currently available. A more concrete funding system for developing these facilities is urgently needed. I sincerely feel that the government would get more value for its money by increasing support for the many small, and relatively less expensive, facilities which cover most of the northern region, than its current policy of establishing a few large "mega-labs", as in Inuvik and Igloolik. These facilities have cost millions to build and operate and since their inception have been grossly underused. Another major problem, which will certainly have a very negative effect on all research facilities in the North, are the tremendous increases in insurance rates which have occurred in the past year.

Personnel

One of the most disruptive and frustrating things about working in the North is the high turnover of government officials. For example, over the last 7 years, while doing research at Eskimo Point, N.W.T., I have had to deal with 4 different regional biologists. These well intending individuals may have Ph.D's, M.Sc.'s and even B.Sc.'s, but they often have a negative or at least neutral impact on the area, because they last two years in the job, change the direction of the department and then leave. In general, there is a total lack of *commitment* to the region, and as a consequence, little co 'inuity to policy and programs. Indeed, as programs are continually changed or forgotten, I am amazed at what does get done. An even greater concern is the fact that these officials are not responsible for their decisions as they do not have to live with the results. If poor management decisions are made, they are transferred or promoted out of the area. As a result of these "instant experts", many northerners have a negative attitude towards government policy and southern expertise. This lack of credibility is reflected, as is often the case, in northern humour. As one joke states, "whites have all the answers, but the natives know what they are doing". Another saying related to me by one of my Inuit friends states, "if you are in the North for a day, you can write an article; if you are here for two days, you can write a book". Indeed, the lack of credibility caused by the inexperience and low level of commitment of many northern officials should be a concern of the government and does affect the government's ability to do business and influence development.

From my own experience, I have received greater help in all aspects of my research from a native wildlife officer and other local persons, than from the more highly educated, but more temporary, government officials. Although most of these individuals did not complete grade school, they all did an excellent job collecting data and providing assistance and information. I feel very strongly that government and indeed the North would be better served in the long run, if positions of responsibility and decision making were given to local people, who will remain in the north and who will be affected by the decisions that they make. Although many of these individuals will not have the education that southern regions expect, they will learn on the job and could be provided with relevant courses and programs by southern institutions. Indeed, there is real need for institutions to get more involved in providing relevant and on-site programs for these regions.

Seasonal and long-term data

A major problem in obtaining good data on northern phenomena is that most funding and graduate research programs are limited to 2- to 3-years. This produces data sets for relatively short time periods in an environment where most phenomena occur in major multi-annual cycles. Thus, we never see the entire picture, but only short sequences. In addition, our knowledge of the North is greatly affected by the fact that, with few exceptions, research is carried out only in the summer. Of the hundreds of papers in my personal library on arctic and boreal mammals, I conservatively estimate that over 90% are summer studies and I am sure that similar observations have been made in other disciplines. The reason for this oblique view of the North is quite simple. The most important segment of our population doing research (university personnel), teaches during the winter and can only do field work in the summer. This is a serious problem for a nation in which three-quarters of its land mass is under snow and ice, 50 to 90% of the year. I would suggest that our ineffectiveness in recognizing and solving this problem has had a

significant influence on our ability to develop and populate the northern sectors of this continent. Indeed, the Soviet Union, the United States, and just about every other northern nation has had a better developmental record in this region, than has Canada. As Canadians, we should be wise enough to realize that if we do not develop this region, other nations will do so in spite of us.

Funding

Historically, with the exception of the heady days of the International Biological Program, research in the North has been grossly underfunded. Since the 70's, there has been a general de-emphasis on northern research at a time when major developments are occurring. Petroleum discoveries, territorial provincialization, native self-government, the James Bay water diversion and hydro-electric developments are major reasons why northern research should be increased. The February 26, 1986 budget of the Federal Government will further exacerbate this problem as research funding will be increasingly tied to business and product development (see University Affairs, Association of Universities and Colleges of Canada, April 1986). As a result, most of this funding will be directed to the southern industrial regions, mainly Ontario and Quebec, to the detriment of the North which has a very small industrial base. Indeed, it is tragic that Canada, which has one of the largest pieces of northern real estate in the world, continues to foster a northern policy that amounts to little more than benign neglect.

SUDBURY'S NEW IMAGE — A DREAM BECOMES REALITY UNIVERSITY RESEARCH, THE VEGETATION ENHANCEMENT TECHNICAL ADVISORY COMMITTEE (VETAC) AND THE "GREENING OF SUDBURY"

Keith Winterhalder
Department of Biology, Laurentian University

Abstract: In the Sudbury, Ontario, mining and smelting region, extensive areas of barren land have been created by a century of logging, fire, soil erosion, acidification by sulphur dioxide and particulate metal deposition. A method has been devised for the establishment of a grass-legume cover on steep, eroded, barren slopes by the manual application of ground limestone, fertilizer and seeds without prior site-preparation. Over an eight-year period, more than 2700 hectares of acid, copper- and nickel-contaminated land have

been vegetated in this way under the auspices of VETAC, using government-funded job-creation programmes. Native broad-leaved woody plants are showing rapid colonization of these grassed sites, while native conifers are being planted as part of the programme. Not only has this resulted in the "greening of Sudbury", but there is every indication that the goal of creating a stable, self-sustaining plant community has been realised.

Résumé: Dans la région minière et métallurgique de Sudbury, en Ontario, un siècle de déboisement, d'incendies de forêts, d'érosion du sol, d'acidification par le dioxyde de soufre et de salissage par chute de particules métalliques a abouti à une forte extension des terres dénudées. Les spécialistes ont mis au point des méthodes de remise en végétation des fortes pentes dénudées et érodées, par l'application manuelle de calcaire moulu, d'engrais et de graines de légumineuses herbacées, sans préparation préalable du terrain. Au cours d'une période de huit années, on a ainsi remis en végétation plus de 2 700 hectares de sols acides, contaminés par du cuivre et du nickel, sous les auspices du Comité VETAC, et avec le soutien des programmes de création d'emplois financés par les pouvoirs publics. Des plantes ligneuses à feuilles caduques, bien acclimatées, s'établissent rapidement dans les terres enherbées, où l'on plante également des conifères de la région dans le cadre des programmes mentionnés. Il en est résulté un "verdoiement de Sudbury" et, de plus, tout indique qu'on a réussi à implanter des groupements végétaux stables, et en équilibre permanent.

Introduction

Sudbury, Ontario (46°30'N 81°00'W) is situated on the southern edge of the Precambrian Shield, in a glaciated landscape characterized by a mosaic of rock outcrops, glacial till deposits and lakes. It lies near the northern limit of Braun's (1950) Hemlock-White Pine-Northern Hardwoods vegetational Region. Its original vegetation included extensive stands of *Pinus strobus* (White Pine), *P. resinosa* (Red Pine) and *P. banksiana* (Jack Pine) on rocky and other well-drained sites; *Thuja occidentalis* (White Cedar) swamps and *Picea mariana* (Black Spruce) bogs on lowland sites; and more limited stands of Northern Hardwoods (e.g. *Acer saccharum* (Sugar Maple) and *Betula alleghaniensis* (Yellow Birch) in sheltered situations with rich soils. Extensive logging of the larger Red and White Pines initiated in 1872 was followed by mining and smelting of sulphide ores from 1886 onwards. With mining came the use of smaller trees as mine timbers and as fuel for the open roast beds, while prospectors often burned the remaining vegetation and duff to reveal the bedrock below. Sulphur dioxide from the ground-level roast beds killed remaining vegetation in their vicinity between 1888 and 1929, while smoke from the smelters, containing not only sulphur dioxide, but also copper, nickel and iron particulates, leached and acidified the soil, contaminating it with toxic copper and nickel as well as releasing toxic aluminum from the soil minerals (Winterhalder, 1984a).

The existing soil, having lost its protective vegetation cover, suffered extensive erosion, exacerbated by the intense frost-heaving and needle ice formation that resulted once the insulating leaf-litter was gone. Fires, whether caused by lightning or by man, continued as a significant factor in the degradation of this open environment, with its abundance of tinder-dry dead plant material. Together, these factors formed an interacting holocoenotic environmental complex, illustrated by figure 1.

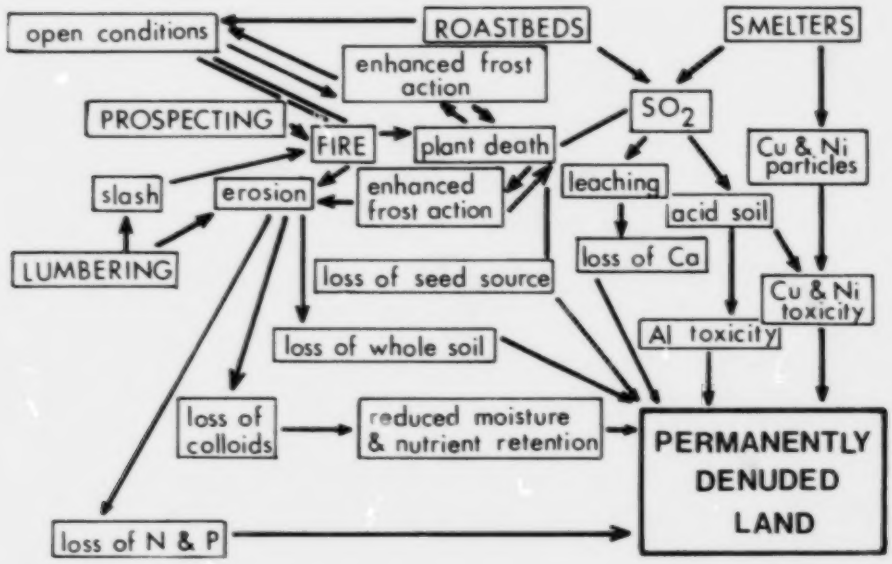


Figure 1. — A simplified representation of some of the major factor interactions leading to the formation of barren land.

The net result was the creation of 10,000 ha of completely barren land, as well as 36,000 ha of open woodland, either dominated by stunted and coppiced *Betula papyrifera* (White Birch) and *Acer rubrum* (Red Maple) referred to by Amiro & Courtin (1981) as the "Birch Transition community", or by *Quercus borealis* (Red Oak).

In 1972, the smelter at Coniston and the iron ore sintering plant at Falconbridge were closed down, while Inco's three smokestacks at the Copper Cliff smelter were replaced by a 381 m stack and Inco's Iron Ore Plant cut back its sulphur dioxide emissions to 250 tonnes/day. With the resultant improvement in atmospheric quality, it was expected that existing stunted vegetation would begin normal growth and that barren areas would be quickly colonized. This only occurred to a limited degree. Existing White Birch and poplar trees grew more rapidly, while at the same time *Agrostis scabra* (Winterhalder, 1976; Balsillie, McIlveen & Winterhalder, 1978), multiple metal-tolerant *Deschampsia caespitosa* (Cox & Hutchinson, 1980) and sometimes tolerant (indigenous) *Agrostis gigantea* (Hogan & Rauser, 1979) and *Poa compressa* (Rauser & Winterhalder, 1985) increased their coverage of the moister barrens. On the stony hillsides in the vicinity of Coniston, scattered White Birch seedlings became established, while on barren hillsides near shrubby bogs, *Betula pumila* var. *glandulifera* began to move up the slopes. In many barren sites, however, no colonization occurred.

Analysis of soil from the pollution zones surrounding the three smelters shows a pattern of decreasing pH and increasing copper and nickel contents as the smelters are approached. On barren sites, soil pH ranges from 2.0 — 4.5, while total copper and nickel content can each reach 1000 ug/g (Hutchinson & Whitby, 1974). "Available" copper, nickel and aluminum frequently approach 100 ug/g.

Bioassay experiments showed that barren soils were inhibitory to root growth, and that these soils could be detoxified by treatment with ground limestone. It appears (Winterhalder, 1983b) that the detoxifying effect of limestone involves both a calcium and a neutralizing component, which together modify the interacting toxic effects of aluminum, copper and nickel ions. This single ameliorative act triggers colonization both through primary effects such as metal detoxification, improved mineralization of soil organic matter and increased phosphorus availability, and through secondary effects related to improved root growth, such as improved moisture availability and protection against frost heaving.

Sandy barren soils treated with limestone and seeded with *Poa compressa* (Canada Bluegrass), a drought-resistant species well suited to sandy soils, retained a grass cover for a number of years, but the plants did not spread beyond the limed area. Following limestone application, soil phosphorus emerged as the secondary limiting factor. A six-acre sandy, barren site in the valley of Coniston Creek was successfully treated in this way in 1974 using conventional agricultural machinery, and a number of herbaceous and woody species have colonized the area, the woody species including willows, poplars and the nitrogen-fixing shrub *Comptonia peregrina* (Sweet Fern).

Early field trials

Since the percentage of land accessible to farm machinery is limited, attention was next turned to the barren hillsides. These consisted of rock outcrops with shallow soil pockets, as well as extensive slopes of partly-eroded soil covered by the layer of boulders and pebbles that was left behind as the finer materials were eroded away. Earlier attempts to revegetate steep, stony slopes (e.g. Peters, 1978) had required the prior use of heavy landscaping machinery, and were too expensive to use on a large scale. In late summer of 1984, several one-metre-wide strips of rocky slope were treated manually with a surface application of ground dolomitic limestone (12 t/ha), 7-7-7 fertilizer with 40% urea-formaldehyde nitrogen (0.9 t/ha) and seed mixture (85 kg/ha). The constitution of the seed mixture is given in table 1.

Table 1. — Seed mixture used on test strips

Species		% Composition by volume
Agrostis gigantea	Redtop	33
Festuca rubra	Creeping Red Fescue	33
Poa compressa	Canada Bluegrass	15
Deschampsia flexuosa	Wavy Hairgrass	9*
Agrostis scabra	Tickle Grass	5*
Phalaris arundinacea	Reed Canary Grass	5

*Native species, seeds collected locally by hand

Within a few weeks, germination occurred between and beneath the stony covering. It appears that the stones acted as a mulch, trapping limestone, seeds and fertilizer, preventing erosion and conserving moisture. A good grass cover was produced, which was sustained over a number of years without further soil amelioration.

Following the success of the one metre wide strips, two local elementary schools were invited to supply volunteers during mid-August of 1975 & 1977, to treat small patches of barren ground (0.5 ha) near their schools. In both cases, excellent plant cover was achieved.

The operational programme

In 1978, Inco Limited announced that it would institute a summer break, rather than hiring students as had been done previously. Bill Lautenbach, a planner with the Regional Municipality of Sudbury and a member of the Municipality's Technical Tree Planting Committee, realising that there would be a dearth of student jobs in the Region, suggested that application be made to the federal government for job-creation funds for the purpose of hiring post-secondary students. These students would implement the previously tested manual technique at the operational level. The application for funds was successful and the Sudbury Regional Land Reclamation Programme was born under the guidance of the now renamed Advisory Committee (VETAC). During the first year of the Programme, 174 students were employed, 82 of them on liming, fertilizing and seeding. Pulverized dolomitic limestone was dumped at strategic sites, bagged by the students and distributed on the hillside at a spacing that gave an approximate coverage of 10 t/ha when spread. Fertilizer (5:20:20) was spread at a rate of 0.4 t/ha, using a hand-operated "Cyclone" seeder, followed by seed application at a rate of 45 kg/ha using the same spreader. In 1978, 115 ha of barren land were grassed in this way. During the years that followed, 200 - 300 students and other unemployed persons were hired each year, with 1983 being exceptional in that 1300 persons were employed, many being unemployed mine workers hired on joint Federal-Provincial funding. Between 1978 and 1986, a total of 2700 ha of land have been treated in this way, approximately 25% of the total barren area (Lautenbach, 1985).

The seed mixture used in the Regional Land Reclamation Programme (table 2) is a modification of that used in the earlier trials. Reed Canary Grass, a relatively unsuccessful species, was dropped, while the percentage of Creeping Red Fescue, which was only successful in certain microhabitats, was reduced. Since native grass species were found to colonize readily by natural dispersal, they were also omitted from the mixture. In fact, although *Deschampsia flexuosa* would appear to be an appropriate species for rocky hillsides, it is in fact *D. caespitosa* that colonizes such sites, especially where there is ample moisture such as in seepage areas or at the base of rock-outcrop catchments. *Agrostis scabra*, although a highly tolerant species on contaminated soils, is a somewhat ephemeral perennial, and contributes little towards creating a permanent plant community (Winterhalder, 1976). Two herbaceous, acid-tolerant legumes were added to the mixture, since nitrogen, although not limiting during the first year, becomes so shortly thereafter.

Table 2. — Regional Land Reclamation Programme seed mixture*

Species		% Composition by weight
Agrostis gigantea	Redtop	20
Phleum pratense	Timothy	20
Poa compressa	Canada Bluegrass	15
Poa pratensis	Kentucky Bluegrass	15
Festuca rubra	Creeping Red Fescue	10
Lotus corniculatus	Birdsfoot Trefoil	10
Trifolium hybridum	Alsike Clover	10

*The mixture varied slightly from year to year

In the small-scale trials, good quality-control had been possible in the application of ameliorants and seeds, but the spreading of limestone, fertilizer and seed in the larger operational programme was distinctly patchy, creating a mosaic of differing soil pH, nutrient status and seed supply. This proved beneficial with respect to species diversity, since colonization by volunteer species was much more extensive than in the evenly-treated smaller plots, and species diversity was improved.

Liming as a trigger factor

Occasionally, through accident or lack of materials, an area was limed but fertilizer and seeds were omitted. In such cases it was noted that, within a year, colonization by mostly woody plants occurred. This led to the setting up of a number of one-metre-square experimental plots on barren ground, to which a thin sprinkling of limestone was applied. It was found that colonization by Tickle Grass and White Birch or Trembling Aspen occurred rapidly in these plots.

Some birch mortality occurred as a result of winter frost-heaving, an important environmental factor in these exposed, plant-litter-free soils. However, most of the root systems produced by these birch seedlings in the limed soil were sufficient to prevent their complete uprooting by frost action and subsequent death. At the Garson site, based on five one-square-metre plots, 41% of the seedlings showed signs of frost-heaving during their first winter, but mortality was only 33%. Table 3 shows final Importance Values (based on percent cover and percent frequency) for species colonizing 12 one-metre-square limed plots on varied terrain, measured five to six years after treatment.

These data suggest a tendency for birches to become dominant over a period of several years, even when poplars and willows initially colonize in greater numbers.

Colonization of revegetated areas

Revegetated areas are being monitored annually, and already some interesting changes appear to be taking place. Early herbaceous colonizers include Yarrow (*Achillea lanulosa*), Pearly Everlasting (*Anaphalis margaritacea*) and a sedge (*Carex aenea*) (Winterhalder, 1983a). The gradual increase in Importance Value (Relative Cover + Relative Frequency/2) of Pearly Everlasting is shown in figure 2.

Table 3. — Importance Values (Cover/Frequency Index*) for species colonizing 12 limed one-metre-square plots

Species	Mean % Cover	% Frequency	Importance Value
Woody			
Betula papyrifera	41.3	66.6	47.5
Salix spp.	3.6	50.0	11.5
Populus tremuloides	3.3	41.7	9.8
Populus grandidentata	0.8	8.3	2.1
Herbaceous			
Agrostis scabra	5.6	83.3	18.8
Rumex acetosella	1.3	8.3	2.5
Aralia hispida	0.8	8.3	2.1
Conyza canadensis	0.1	8.3	1.5
*Festuca rubra***	0.1	8.3	1.5
*Phleum pratense***	0.1	8.3	1.5
*Poa compressa***	0.1	8.3	1.5

*Relative Frequency + Relative Cover/2
**Seeds blown in from nearby revegetated area

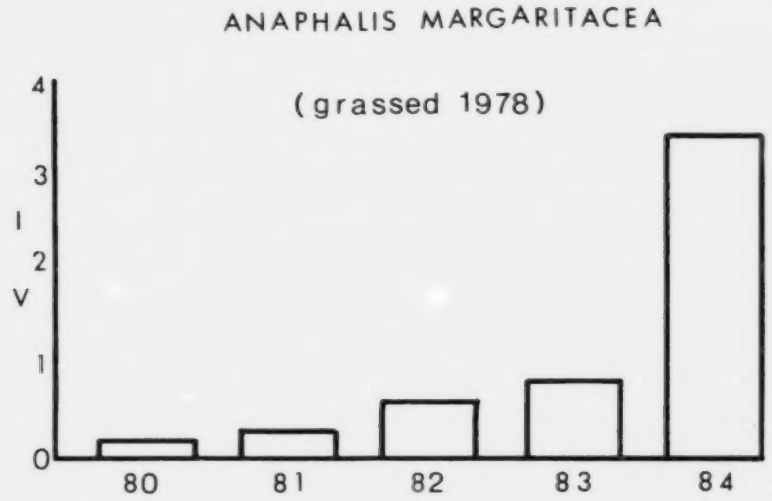


Figure 2. — Importance Values for *Anaphalis margaritacea*, 1–3 km east of the Coniston smelter, over a five-year period following treatment.

While grass cover appears to be falling off, that of nitrogen fixers, especially Birdsfoot Trefoil is increasing rapidly (figure 3).

Also on the increase is cover by woody colonists such as Trembling Aspen and willows. This is particularly well shown along Highway 144, northwest of Sudbury (figure 4).

So far, the woody colonists have been species that possess wind-dispersed seeds. The hairy seeds of the poplars and willows can be carried a considerable distance. The winged samaras of the White Birch may not be carried very far, but there is often an occasional seed tree in the vicinity of a barren site. So far there has been no evidence of spontaneous establishment of conifers. The reason for this is still a matter for conjecture, but the relative rarity of coniferous seed trees and the lack of a non-toxic mineral seed bed must be contributing factors.

Tree and shrub planting programme

Because there has so far been no spontaneous colonization by conifers, a programme of conifer planting was initiated in 1979. Both bare-root and container (Japanese Paper Pot) stock of Red, Jack and White Pine, as well as White Cedar and European Larch (*Larix decidua*) have been planted, with Jack Pine giving the best results.

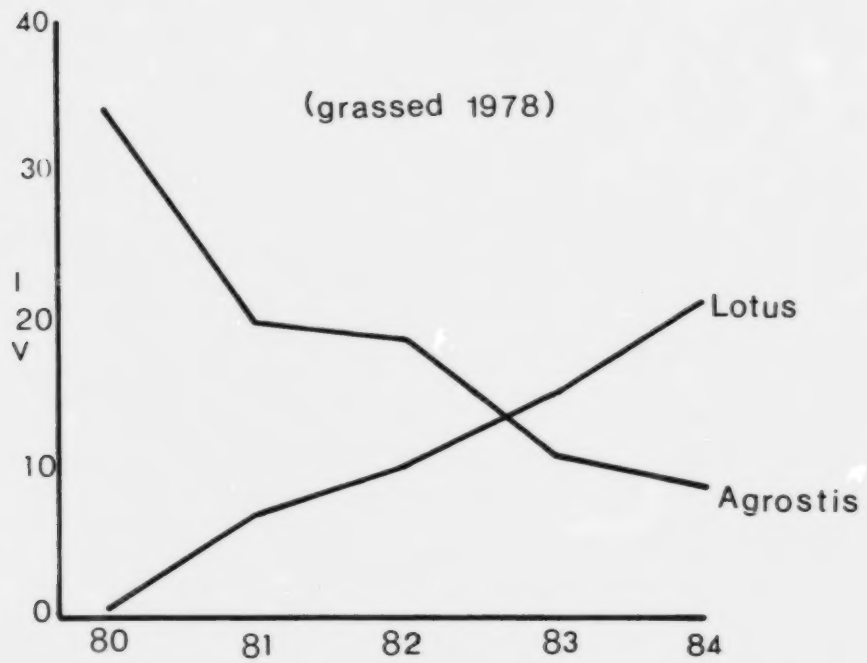


Figure 3. — Importance Values for *Agrostis gigantea* and *Lotus corniculatus*, 1–3 km east of the Coniston smelter, over a five-year period following treatment.

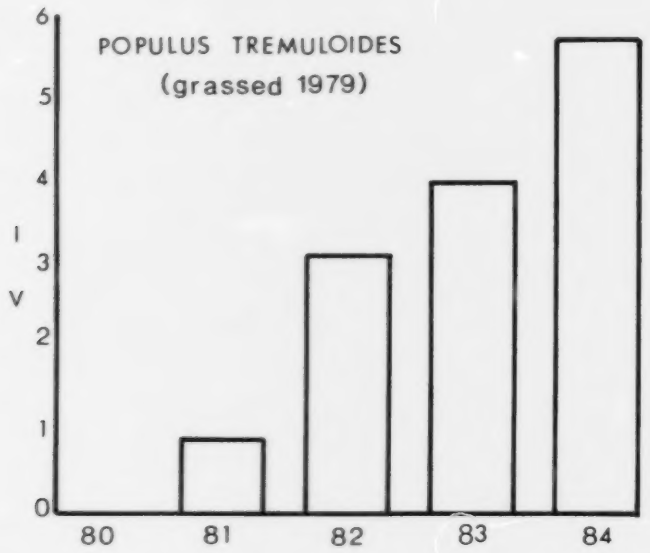


Figure 4. — Importance Values for *Populus tremuloides*, 2 km northeast of the Copper Cliff smelter, over a four-year period following treatment.

Experimental shrub plantings have also been made, using Soapberry (*Shepherdia canadensis*) and Bearberry (*Arctostaphylos uva-ursi*), transplanted from Manitoulin Island. The former is a well-known symbiotic nitrogen-fixer. The latter, a woody creeper, is not known to fix nitrogen, but the formation of nitrogen-fixing nodules has been reported from Alaska in another member of the genus (Bond, 1967). The green, healthy appearance of Bearberry plants on the nitrogen-deficient reclaimed Sudbury sites suggests that the role of the species in the nitrogen cycle is worth further investigation.

Liming and metal cycling

A question of some concern is whether vegetation that is established on metal-contaminated land will take up metals which will be passed on through the food-chain and possibly prove damaging at the higher trophic levels. Although all levels of the food-chain have not been analyzed, there is at least evidence (Winterhalder, Beckett & Todd, 1984) that liming reduces uptake of metals, especially aluminum, both in tolerant grasses such as *Deschampsia caespitosa* and in planted conifers.

Discussion

Limestone as a trigger factor

The most striking aspect of this study is the fact that surface application of pulverized dolomitic limestone detoxifies the soil, thereby acting as a "trigger factor" (Winterhalder,

1983b) and allowing the immediate establishment of native plants from the existing seedbank and from seeds that blow in. Following limestone application, growth of roots is no longer inhibited, and they can enter the soil freely, giving them access to moisture and nutrients and giving the plant some anchorage against frost-heaving. Results of interaction experiments (Winterhalder, 1983b) indicate that the detoxifying effect involves both calcium nutrition and a neutralization component, which together modify the interacting toxic effects of aluminum, copper and nickel.

Although ground dolomitic limestone has been used because of its availability and safe manual handling properties, it has been shown that basic industrial wastes such as cement kiln bypass dusts (Winterhalder, 1984b) can be used as an alternative liming material.

Seeding versus non-seeding

Although experiments have shown that vegetation can be established by the application of dolomitic limestone alone, the practice of the Sudbury Regional Land Reclamation Programme is to apply, in addition, fertilizer and a grass-legume seed mixture. Since public funds are used on the project, and since a prime objective is image-enhancement, the Regional Government favours the rapid greening achieved by a complete grass cover in the first year following treatment. A second advantage of seeding with agronomic species is the resulting establishment of nitrogen-fixing herbaceous legumes, probably essential to the developing ecosystem. The fertilizer that is applied has a relatively low nitrogen content (6-24-24), and legumes, especially Birdsfoot Trefoil, spread rapidly under these nitrogen-deficient conditions.

There are, however, a number of arguments that can be made in support of using limestone alone, rather than limestone, fertilizer and seed. Not only is there an economic advantage to the simpler procedure, but the risk of eutrophication of watercourses and lakes by widespread fertilization is avoided. To the ecologist or the phytogeographer, the use of the existing local native and naturalized flora as a seed source avoids the introduction of alien species into a system that it is hoped will eventually become stable, self-sustaining and quasi-natural.

In the balance, however, and from the point of view of the final structure of the plant community developed, there may be some advantage in using a light agronomic seed application along with the limestone, since this leads to an open spacing between woody colonizers. While too heavy a seed and fertilizer application gives a closed sward that cannot be colonized, unseeded sites tend to develop a closed canopy of birches or poplars approximately five years after establishment. Table 4 is a comparison of the plant cover achieved in two years in two contiguous 100 square metre plots. The first plot was treated with limestone alone, the second with limestone, fertilizer and seeds. Plant cover was assessed in each plot by using 25 regularly-placed 1-metre-square quadrats.

It should be noted that, two years after treatment, the percent cover by living plants is twice as high in the seeded area as in the unseeded area. Furthermore, most of the approximately 50% of the ground not covered by living plants in the seeded area was covered by dead plant material. Woody plant cover is much higher in the unseeded site, however, as is the number of woody individuals (not included in the table). In the seeded plot, it is likely that the germination and establishment of woody species is inhibited by dense

growth of grasses in the first year and by this plus dead plant material in the second season. It should be emphasized, however, that an extremely low colonization rate by woody species is characteristic of small experimental seeded plots, where application of ameliorant and seed is carried out with care. As mentioned earlier, the environmental mosaic formed by the more "careless" treatment prevalent in a manual, operational programme favours the establishment of woody species.

Table 4. — Percent Cover and Importance Value (Cover/Frequency Index) achieved in two years by sown species and colonizers on an limed, fertilized and seeded plot and on a unseeded, unfertilized limed plot

	Seeded Plot		Unseeded Plot	
Species	% cover	IV	% cover	IV
Sown species				
Agrostis gigantea	14.1	25.5	2.5	13.8
Festuca rubra	9.9	20.7	0.0	0.0
Lotus corniculatus	5.3	13.3	0.0	0.0
Trifolium hybridum	3.8	8.9	0.0	0.0
Poa compressa	0.1	1.3	0.7	6.5
Phleum pratense	0.1	0.5	0.1	0.9
Poa pratensis	0.1	0.5	0.1	0.5
Woody colonizers				
Populus tremuloides	0.6	1.5	9.1	29.1
Salix spp.	0.1	0.9	5.5	20.1
Betula papyrifera	0.0	0.0	0.4	4.5
Populus grandidentata	0.0	0.0	0.0	3.2
Herbaceous colonizers				
Agrostis scabra	0.7	6.9	3.4	16.5
Carex aenea	0.0	0.0	0.3	2.1
Juncus brevicaudatus	0.0	0.0	0.1	1.3
Deschampsia caespitosa	0.0	0.0	0.2	2.1
Equisetum arvense	0.0	0.0	0.1	0.5
Rumex acetosella	9.4	17.9	0.0	0.0
Trifolium pratense	0.3	1.1	0.0	0.0
Chrysanthemum leucanthemum	0.1	0.5	0.0	0.0
Epilobium angustifolium	0.1	0.5	0.0	0.0
Total	44.7	100.0	22.5	100.0

Although the unseeded plot had a total plant cover of only 22.5% two years after treatment, it is predicted that the canopy will almost certainly be closed within a few more years, and that intense competition will result. It should be noted that, although percent

cover by birch was low at the time of assessment (August, 1985), a number of small seedlings were present. Judging by the results of the 1 metre square limed plots (table 3), these seedlings may well dominate the canopy by the end of six years.

Prognosis

Only monitoring over a number of decades will tell whether a self-sustaining, maintenance-free plant community and ecosystem is a feasible end-product on the Sudbury barrens. The replacement of grasses by woody species may lead to renewed soil-erosion, unless the woody plants are able to produce a sufficient canopy and leaf litter cover to forestall this. The applied limestone will no doubt lose its efficacy as plant uptake of calcium and leaching of bases proceed. This deterioration in soil base status and pH should take place slowly enough, however, to apply gentle selection pressure on the plant populations present, ensuring that the most tolerant individuals and populations will eventually dominate.

References

Amiro, B.D. & G.M. Courtin. 1981. The patterns of vegetation in an industrially disturbed ecosystem, Sudbury, Ontario. Canadian Journal of Botany 59(9): 1623–1639.

Balsillie, D., W.D. McIlveen & K. Winterhalder. 1978. Problems of regeneration of stressed ecosystems. Paper 78-44.6, Proceedings 71st Annual Meeting, Air Pollution Control Association, Houston, Texas, June 25–30, 1978. 39 pp.

Bond, G. 1967. Fixation of nitrogen by higher plants other than legumes. Annual Review of Plant Physiology 18: 107–126.

Braun, E. Lucy. 1950. Deciduous Forests of Eastern North America. Hafner: New York. 596 pp.

Cox, R.M. & T.C. Hutchinson. 1980. Multiple metal tolerances in the grass *Deschampsia caespitosa* (L.) Beauv. from the Sudbury smelting area. New Phytologist 84: 631–647.

Hogan, G.D. & W.E. Rauser. 1979. Tolerance and toxicity of cobalt, copper, nickel and zinc in clones of *Agrostis gigantea*. New Phytologist 83: 665–670.

Hutchinson, T.C. & L.M. Whitby. 1974. Heavy metal pollution in the Sudbury mining and smelting region of Canada. I. Soil and vegetation contamination by nickel, copper and other metals. Environmental Conservation 1: 123–132.

Lautenbach, W.E. 1985. Land Reclamation Programme 1978–1984. Regional Municipality of Sudbury. 65 pp. + map.

Peters, T.H. 1978. Inco Metals reclamation programme. Proceedings 3rd Annual Meeting, Canadian Land Reclamation Association, Sudbury, Ontario. pp. 31–38.

Rauser, W.E. & E.K. Winterhalder. 1985. Evaluation of copper, nickel and zinc tolerances in four grass species. Canadian Journal of Botany 63: 58–63.

Winterhalder, K. 1976. Reclamation studies on industrial barrens in the Sudbury region — a progress report. Proceedings of the Inaugural Meeting, Canadian Land Reclamation Association, University of Guelph, December 1975. pp. 65–68.

Winterhalder, K. 1983a. The use of manual surface seeding, liming & fertilization in the reclamation of acid, metal-contaminated land in the Sudbury, Ontario mining and smelting region of Canada. Environmental Technology Letters 4: 209–216.

Winterhalder, K. 1983b. Limestone application as a trigger factor in the revegetation of acid, metal-contaminated soils of the Sudbury area. Proceedings 8th Annual Meeting, Canadian Land Reclamation Association, Waterloo, Ontario. pp. 201–212.

Winterhalder, K. 1984a. Environmental degradation and rehabilitation in the Sudbury area. Laurentian University Review 16(2): 15–47.

Winterhalder, K. 1984b. The use of cement Kiln by-pass dust as a liming material in the revegetation of acid, metal-contaminated land. Proceedings of the 9th Annual Meeting, Canadian Land Reclamation Association, August 21–24, Calgary. pp. 1–29.

Winterhalder, K., P.J. Beckett & M.R. Todd. 1984. Metal dynamics in a revegetated ecosystem at Sudbury, Canada. Proceedings International Conference on Environmental Contamination, London, July 1984. pp. 499–504.

UNIVERSITÉ DU QUÉBEC EN ABITIBI-TÉMISCAMINGUE
42, rue Mgr Rhéaume est
Rouyn, Québec
J9X 5E4

(819) 762-0971

L'UNIVERSITÉ DU QUÉBEC EN ABITIBI-TÉMISCAMINGUE ET SON AVENIR

Rémy Trudel
Recteur de l'Université du Québec en Abitibi-Témiscamingue

Résumé: L'Université du Québec en Abitibi-Témiscamingue offre des services universitaires depuis 1970. Elle opère dans le Nord du Québec, sur un territoire de 116 000 km^2, et couvre également le territoire de la Baie James. Sa mission, essentiellement nordique, lui permet de rejoindre quelque 2 500 étudiants disséminés dans ces territoires. Elle offre des programmes de formation de 1er et 2^e cycles dans sept secteurs disciplinaires. Sa programmation de recherche lui permet de toucher à tous les secteurs de l'activité humaine dans le Nord du Québec. Ses quelque 300 ressources professorales, à temps complet et à temps partiel, lui permettent d'être un agent important de la mise en valeur des richesses naturelles de son territoire.

Abstract: L'Université du Québec en Abitibi-Témiscamingue has offered university-level services since 1970. It operates in northern Quebec, in an area of 116,000 km^2, extending over the territory of the Baie James. The University's mission, essentially a northern mission, allows it to link up with some 2,500 students spread all over the region. It offers 1st and 2nd Cycle teaching programs in seven disciplinary sectors. Its research programs involve all aspects of human activity in northern Quebec. The faculty of 300, full time and part-time, allow the University to be an important agent in the development of the natural resources of the region.

Historique

Le 20 octobre 1983, le Lieutenant-gouverneur en conseil instituait par lettres patentes l'Université du Québec en Abitibi-Témiscamingue (UQAT).

L'Université du Québec en Abitibi-Témiscamingue fait partie du réseau de l'Université du Québec dont les autres constituantes sont l'Université du Québec à Chicoutimi (UQAC), l'Université du Québec à Hull (UQAH), l'Université du Québec à Montréal (UQAM), l'Université du Québec à Rimouski (UQAR), l'Université du Québec à Trois-Rivières (UQTR), l'École nationale d'administration publique (ENAP), l'École de technologie supérieure (ETS), l'Institut Armand-Frappier (IAF), l'Institut national de la recherche scientifique (INRS) ainsi que la Télé-université (TELUQ).

L'Université du Québec en Abitibi-Témiscamingue s'est progressivement implantée dans un territoire d'une superficie de 116 500 km^2, pour desservir une population de quelque 150 000 habitants. Elle a battu pavillon à Rouyn-Noranda d'abord, pour essaimer ensuite dans les dix plus importants centres urbains de la région, depuis Ville-Marie, à 135 km

au Sud, jusqu'à Chibougamau, à 493 km au Nord. Elle dispense aussi des enseignements aux adultes dans le territoire de la Baie James, à Radisson et à Puvungnituk chez les communautés inuit.

Population de l'Abitibi-Témiscamingue par districts desservis par l'université

Districts	Bassin de population*	Distance du campus central en km
Rouyn-Noranda	38 000	—
Val-d'Or	25 000	106
Amos	16 000	110
La Sarre	26 500	86
Matagami	4 000	290
Barraute-Senneterre	6 500	173
Lebel-sur-Quévillon	2 500	261
Chapais-Chibougamau	13 000	493
Ville-Marie	17 000	136
Malartic	8 000	80
Nouveau-Québec	15 000	1 200

*Statistiques Canada, 1981, en chiffres arrondis

La caractéristique première à la base de l'expansion de cette université est la très vaste étendue du territoire couvert pour desservir une population à faible densité. La volonté d'offrir une gamme diversifiée de programmes, afin de satisfaire au mieux les besoins manifestés par la population régionale, rejoint les objectifs fondamentaux poursuivis par l'Université du Québec dans son ensemble, dont le plus important consiste à offrir des services aux populations qui ne pourraient autrement avoir accès à une formation de niveau universitaire.

Le second aspect qu'il convient de souligner, outre l'étendue du territoire et la faible densité de sa population, c'est la nature des besoins. Cette université a davantage cherché à développer des programmes fondés sur des besoins concrets, clairement identifiés, plutôt que d'offrir le large éventail des universités traditionnelles. Elle a donc offert d'abord une formation dans les domaines rattachés à l'éducation, conséquemment à sa mission

d'origine, pour ensuite développer le secteur des sciences de l'administration, des sciences comptables, des sciences de la santé, des sciences sociales, des arts et des lettres et, finalement, des sciences appliquées liées à l'exploitation des ressources du sol depuis quelques années. Les nombreaux rattachements administratifs qui caractérisent l'évolution de l'université régionale n'ont certes pas favorisé une croissance à un rythme plus soutenu. Beaucoup d'efforts ont été investis pour cerner la spécificité et la pertinence d'une université en Abitibi-Témiscamingue, efforts qui ont drainé une bonne part des énergies vives tant du corps professoral que du personnel administratif.

La mission de l'université et ses priorités de développement (1982-1985)

C'est à l'intérieur de son "Plan triennal de développement 1982-1985" qu'est définie la mission de l'Université du Québec en Abitibi-Témiscamingue. Il faut noter, au surplus, que la rédaction du plan 1982-1985 découle précisément des besoins exprimés par l'ensemble de la population régionale, tels qu'ils ont été recueillis à la suite d'une vaste opération de consultation en 1981-1982. Cette mission se présente ainsi:

Considérant la situation géographique de ce territoire dans l'ensemble du Québec, sa grandeur et son mode d'occupation, l'Université du Québec en Abitibi-Témiscamingue définit sa mission par:

1. Une insertion dynamique dans une région caractérisée par sa situation géographique, et particulièrement par sa nordicité, l'ampleur de son territoire rural, sa faible densité démographique et l'importance de ses ressources naturelles;

2. Une participation active dans les domaines de la formation universitaire des ressources humaines liées à la mise en valeur des ressources naturelles et à la gestion de l'environnement;

3. La poursuite des interventions en éducation, en sciences sociales et de la santé, en sciences du comportement humain, en sciences administratives et comptables ainsi que dans le secteur des arts et des lettres.

L'organisation des études de 1er cycle et les programmes

L'Université du Québec en Abitibi-Témiscamingue propose des domaines de spécialisation qui répondent avantageusement aux besoins du marché de l'emploi. Elle dispose de quelque 35 programmes à temps complet et à temps partiel, de 1er et 2e cycle (certificats de 1er cycle, baccalauréats, maîtrises).

On distingue trois cycles d'études universitaires:

1) Les études de 1er cycle

L'étudiant qui entreprend pour la première fois une formation universitaire débute au 1er cycle. Il s'inscrit alors dans un programme de certificat ou de baccalauréat.

Règle générale, un certificat est un programme d'études comportant 30 crédits (10 cours); le baccalauréat, pour sa part, est formé de 90 crédits (30 cours).

Inscrit à temps complet, l'étudiant consacre au minimum une année pour compléter des études conduisant à l'obtention d'un certificat dans un domaine donné, et trois années pour acquérir le grade de bachelier. A temps partiel, il pourra mettre deux années et demie pour compléter un certificat et six années pour atteindre le grade de bachelier, selon le rythme qu'il aura adopté.

2) Les études de 2e cycle

Normalement, il faut avoir complété des études de baccalauréat (90 crédits) avant de pouvoir s'inscrire à un programme de 2e cycle. Les études de 2e cycle conduisent au grade de «maître»; c'est pourquoi on les désigne aussi par l'expression «études de maîtrise». Généralement, les études de maîtrise s'étalent sur trois sessions (45 crédits) auxquelles s'ajoute la rédaction d'un mémoire. Outre la maîtrise, on distingue aussi le «certificat de 2e cycle». Ce programme d'études comporte habituellement 30 crédits.

3) Les études de 3e cycle

Pour avoir accès aux études doctorales, ou de 3e cycle, il faut posséder déjà un diplôme de 2e cycle. Un programme d'études de 3e cycle est composé, le plus souvent, de 90 crédits répartis en six sessions et de la rédaction d'une thèse. Ces études de «doctorat» peuvent être suivies d'études «post-doctorales».

Les modules

Dans le réseau de l'Université du Québec, les études de 1er cycle sont regroupées à l'intérieur des modules. Chaque module est responsable de la définition des objectifs spécifiques des programmes d'études dont il a la charge; c'est lui qui définit le cadre général des programmes sous son autorité, qui les évalue, les révise et en recommande l'adoption, selon le cas; en outre, il procède à l'accueil des étudiants, les renseigne et les dirige dans leur cheminement; de plus, il voit à ce que les étudiants évaluent la qualité des enseignements.

C'est le Conseil de module qui assume ces responsabilités. Il est composé d'un nombre égal de professeurs et d'étudiants, ainsi que de représentants du milieu socio-économique concerné par les programmes d'études offerts au Module.

Un professeur élu par le Conseil de module et nommé par le Conseil d'administration dirige le Module, lieu par excellence de l'encadrement des étudiants de 1er cycle.

A l'Université du Québec en Abitibi-Témiscamingue, on compte actuellement sept modules:

— le Module des sciences de l'administration
— le Module des sciences appliquées
— le Module des sciences comptables
— le Module des sciences du comportement humain
— le Module des sciences de l'éducation
— le Module des sciences de la santé
— le Module des sciences sociales

Les sciences de l'administration

L'Abitibi-Témiscamingue a vu naître nombre de petites et moyennes entreprises au cours de la dernière décennie, qui ont étayé leur développement sur les grandes sociétés oeuvrant dans le domaine de l'exploitation et de la transformation des ressources. Cette diversification de l'économie régionale exige une maîtrise plus grande des outils de gestion et appelle une formation privilégiée dans le domaine de l'administration.

C'est ce qu'a vite compris l'Université du Québec en Abitibi-Témiscamingue, lorsqu'elle a mis sur pied ses programmes dans le domaine des sciences de l'administration. Et la réponse de la population a été immédiate, tellement le besoin était manifeste: rapidement, le Module des sciences de l'administration est devenu un des plus importants de toute l'Université. En effet, on compte annuellement plus de 1 100 étudiants à temps complet et à temps partiel, qui poursuivent une formation unique en ce domaine.

Le Module des sciences de l'administration offre les programmes suivants:

— le Baccalauréat en administration (7764)
— le Certificat de 1er cycle en administration (4122)
— le Certificat de 1er cycle en relations de travail (4182)

Ensemble, ces programmes disposent d'une banque de près de 100 cours, dans des domaines aussi essentiels que la finance, le marketing, la gestion, l'économie, la comptabilité, l'informatique, la statistique, l'administration publique, la gestion du personnel, pour ne mentionner que les plus importants. Tous ces programmes sont offerts, soit à temps complet, au campus de Rouyn, soit à temps partiel, dans tous les autres centres de l'Université en région.

Les sciences appliquées

Dans son premier plan de développement, l'UQAT définissait sa mission comme «une participation active dans les domaines de la formation des ressources naturelles et à la gestion de l'environnement». Le Module des sciences appliquées apporte donc sa contribution à la réalisation de cette mission en regroupant les champs d'études du génie, de l'informatique et de la recherche opérationnelle. Le module des sciences appliquées offre les quatre programmes suivants:

— le Certificat en informatique de gestion
— le Certificat en gestion des opérations
— le Baccalauréat en informatique de gestion, en collaboration avec l'UQAM
— le Baccalauréat en génie (1ère année) en collaboration avec l'École Polytechnique de Montréal

Les sciences comptables

«Pour nous, déclarait le Directeur d'un important bureau de comptables, l'Université du Québec en Abitibi-Témiscamingue est une véritable petite mine». Il faisait allusion à tous ces finissants et finissantes qui viennent enrichir le milieu régional de leur compétence en ce domaine.

Et cette compétence, elle n'est pas surfaite, puisqu'au cours de trois années consécutives, les étudiants de l'Université qui se sont présentés à l'examen général de l'Ordre des comptables agréés ont terminé en première place à l'échelle provinciale. Ce succès, outre la capacité même des finissants, est dû, entre autres, à la taille de l'Université. Les groupes d'étudiants sont plus restreints et l'enseignement plus personnalisé. Une saine émulation motive chacun à une meilleure performance; les résultats bénéficient de cette situation privilégiée.

Les étudiants qui entreprennent des études en sciences comptables peuvent choisir, dès le début de leur formation, de s'orienter vers l'une ou l'autre des corporations professionnelles: comptables agréés (c.a.), comptables généraux licenciés (c.g.a.), comptables en administration industrielle (r.i.a.).

Le Module des sciences comptables offre les programmes suivants:

— le Baccalauréat en sciences comptables (7766)
— le Certificat de 1er cycle en sciences comptables (4138)

Le Baccalauréat est offert à temps complet et à temps partiel au campus de Rouyn, et à temps partiel seulement au centre de Val-d'Or. Le Certificat est offert, à temps partiel seulement, à Rouyn et à Val-d'Or.

Les sciences du comportement humain

La société québécoise a connu de profondes modifications dans ses structures depuis une vingtaine d'années. Ces changements profonds ont fait naître de nouveaux comportements, ont provoqué des attitudes différentes et des conceptions inédites. Les «crises» se succèdent et l'adaptation de toutes les couches sociales ne se fait pas sans ruptures, sans déchirements.

Les programmes d'études en sciences du comportement humain proposent une compréhension globale des mécanismes du comportement humain ainsi que des difficultés d'adaptation qui peuvent surgir; ils creusent les nouveaux concepts de normalité ou d'anormalité, et explorent les mécanismes du comportement dans telle situation. Ils visent moins à former des praticiens de la psychologie qu'à permettre une saisie globale du phénomène du comportement humain dans le contexte de la société contemporaine. Ils s'intéressent autant aux individus qu'aux collectivités.

Les programmes offerts en sciences du comportement humain sont les suivants:

— le Baccalauréat en psycho-éducation (7815)
— le Certificat de 1er cycle en psychologie générale (4231)
— le Certificat de 1er cycle en communication

Les sciences de l'éducation

Dès ses origines, l'Université du Québec en Abitibi-Témiscamingue a reçu comme mission de pourvoir à la formation et au perfectionnement des maîtres. Cette mission, l'Université l'a traduite dans des programmes fort bien adaptés, dont se sont prévalus des centaines d'étudiants.

Que ce soit une formation dans le domaine de l'enseignement général ou professionnel, une spécialisation plus grande pour les maîtres déjà en exercice, une compétence accrue dans un domaine en particulier, ou une initiation d'appoint aux applications pédagogiques de l'ordinateur, le Module des sciences de l'éducation offre un vaste choix de programmes qui répondent à des goûts personnels et aux exigences actuelles. Quelque 250 étudiants entreprennent annuellement une formation en ce domaine.

Les programmes offerts en sciences de l'éducation sont les suivants:

— le Baccalauréat d'éducation au préscolaire et d'enseignement au primaire (7812)
— le Baccalauréat d'enseignement en administration (7768)
— le Baccalauréat en enseignement professionnel (7746)
— le Baccalauréat en sciences de l'éducation (7745)
— le Certificat de 1er cycle en applications pédagogiques de l'ordinateur (4261)
— le Certificat de 1er cycle de perfectionnement de la pratique éducative pour les maîtres en exercice (4230)
— le Certificat de 1er cycle en sciences de l'éducation (enseignement professionnel) (4052)
— le Certificat de 1er cycle en sciences de l'éducation (4051)
— le Programme court d'initiation à la science informatique (0029)
— le Programme court d'introduction à la micro-informatique (0033)
— le Programme court de perfectionnement en sciences religieuses I (0032)
— le Programme court de perfectionnement en sciences religieuses II (0036)
— le Programme court de perfectionnement en sciences morales I (0037)

Les sciences de la santé

Il faut bien gérer les entreprises pour qu'elles fonctionnent en vue d'un rendement maximal; il faut aussi apprendre à gérer la santé et à favoriser la prise en charge, par les intéressés eux-mêmes, de leur état de santé. Or, une formation adéquate qui s'arrête aux divers aspects de la santé à tous les âges de la croissance d'un individu, est de plus en plus nécessaire. Que ce soient les problèmes reliés au vieillissement, la santé mentale, les moyens de prévenir la maladie, les soins en pédiatrie, voilà autant de sujets qui appellent une meilleure connaissance et qui exigent des habiletés particulières.

Les programmes en sciences de la santé offerts à l'Université du Québec en Abitibi-Témiscamingue s'adressent à deux types d'étudiants; ceux, d'abord, qui oeuvrent déjà dans le domaine de la santé à titre d'infirmiers et d'infirmières; ceux, ensuite, que leurs préoccupations placent immédiatement en contact avec des groupes de personnes qui nécessitent une forme particulière d'intervention.

Les programmes offerts en sciences de la santé sont les suivants:

Pour les infirmiers et infirmières en exercice

— le Baccalauréat en sciences infirmières (7855)
— le Certificat de 1er cycle en soins infirmiers cliniques (4229)
— le Certificat de 1er cycle en nursing communautaire (4101)

Pour une clientèle plus large, soucieuse de la santé de groupes plus spécifiques

— le Certificat de 1er cycle en santé et sécurité au travail (4253)
— le Certificat de 1er cycle en gérontologie (4193)
— le Certificat de premier cycle en santé mentale

Les sciences sociales

Si l'évolution de la société influence le comportement de l'individu sur le plan psychologique, on observera de même une influence dans ses relations sociales. Les sciences sociales étudient cette dynamique du développement de la personne et des groupes. Elles considèrent attentivement l'évolution des groupes sociaux, tels la famille, les groupes politiques, les idéologies qui les façonnent; elles s'arrêtent aux processus de formation et d'éclatement des groupes sociaux; elles étudient les approches et les techniques d'intervention, d'organisation et d'animation.

Les programmes en sciences sociales de l'Université du Québec en Abitibi-Témiscamingue allient connaissances théoriques et activités pratiques, en proposant des travaux fondés sur l'observation concrète de certains milieux. Ils collent aux préoccupations des étudiants qui s'y inscrivent et visent un apprentissage pratique.

Les programmes offerts en sciences sociales sont les suivants:

— le Baccalauréat en travail social (7798)
— le Baccalauréat en sciences humaines
— le Certificat de 1er cycle en animation (4156)
— le Certificat de 1er cycle en sciences juridiques
— le Programme court en toxicomanie (0030)

Les arts et les lettres

Les arts et les lettres tiennent une place prépondérante dans l'ensemble de la vie collective. Par leurs créations, les artistes et les écrivains révèlent, en quelque sorte, l'état d'âme d'une société. Ils expriment, par le biais d'un médium ou l'autre, tel la peinture, la sculpture, le modelage, les espoirs ou les désespoirs, les aspirations ou les inspirations de tout un peuple. Ces formes d'expression supposent toutefois des techniques de communication. Outre le talent personnel d'un artiste, il faut encore s'initier aux techniques, aux formes, aux procédés, aux structures.

La culture s'atrophie quand la société n'engendre plus des communicateurs, des artistes. C'est ce qu'a compris l'Université du Québec en Abitibi-Témiscamingue quand elle a lancé ses programmes en arts plastiques et en lettres. Artistes professionnels ou simplement amateurs, nombreux sont ceux qui ont entrepris une formation en arts plastiques ou qui poursuivent leur formation après avoir terminé un diplôme d'études collégiales.

Les programmes offerts en arts plastiques sont les suivants:

— le Baccalauréat en arts plastiques (7762)
— le Certificat de 1er cycle en arts plastiques (4172)

Dans le domaine des lettres, l'Université dispense actuellement un programme de Certificat de 1er cycle en enseignement du français au primaire, qui a pour but de rendre l'enseignant capable de créer des situations d'apprentissage en français, langue maternelle, eu égard aux objectifs définis dans le programme du primaire.

Les programmes offerts en lettres sont les suivants:

— le Certificat de 1er cycle en enseignement du français au primaire (PPMF) (4185)
— le Programme court en production littéraire: le discours de fictions (0038)

Les études avancées

Les programmes d'études avancées jouent un rôle de premier plan dans le développement d'une université. Ils permettent l'accroissement des compétences de nombre de personnes. Ils entraînent également la venue de professeurs invités, particulièrement qualifiés dans un domaine donné. Ils provoquent des recherches et des études de cas concrets, dans l'un ou l'autre des aspects de la vie collective. Les travaux de recherche conduits par les étudiants augmentent la connaissance du milieu et rendent possibles des actions concrètes en vue d'améliorer la qualité de la vie.

L'Université du Québec en Abitibi-Témiscamingue dispense trois programmes de 2e cycle. La Maîtrise en éducation est offerte par extension du programme de l'Université du Québec à Rimouski.

La Maîtrise en gestion des petites et moyennes organisations est offerte à Rouyn, par extension du programme de l'Université du Québec à Chicoutimi. Ce programme plus quantitatif s'intéresse particulièrement aux secteurs de la petite et moyenne entreprise, des coopératives et de la petite et moyenne organisation de type public ou parapublic, dans le but de favoriser le développement de l'entrepreneurship et la création d'entreprises.

La Maîtrise en gestion de projet est un programme qui est offert conjointement par plusieurs constituants du réseau de l'Université du Québec (à Chicoutimi, à Hull, à Montréal, à Trois-Rivières et en Abitibi-Témiscamingue). Ce programme poursuit l'objectif fondamental de former des administrateurs capables de gérer des projets d'envergure, tels la construction de ponts, de barrages hydro-électriques, d'immeubles, etc.

Des études supérieures dans une région, c'est fondamental. Elles sont des stimulants pour la recherche et elles injectent des compétences nouvelles dans le milieu.

La recherche

Le développement progressif du corps professoral, la hausse des critères d'embauche et l'obtention du diplôme de doctorat chez plusieurs professeurs ont permis, au cours des six dernières années, d'atteindre la masse critique nécessaire au développement de la recherche.

A ce chapitre, la seule augmentation du volume des subventions, contrats et commandites de recherche est éloquente. Totalisant, en 1982-1983, la somme de 308 345 $, les

subventions, contrats et commandites passent à 472 542 $ en 1983–1984, pour atteindre 712 531 $ en 1984–1985.

Alors qu'il y a quatre ou cinq ans, la totalité des subventions provenait de fonds internes auxquels s'ajoutaient des contributions du réseau de l'Université du Québec ainsi que les volets PPMF et PPMEP du ministère de l'Éducation, on note aujourd'hui une prédominance des subventions en provenance de l'extérieur, incluant celles d'organismes majeurs. La recherche à l'UQAT se déploie dans un certain nombre de champs.

Les sciences du comportement humain

C'est dans ce domaine que parurent les premières publications scientifiques de l'Université.

Appuyées par les Laboratoires de psychologie expérimentale et de motricité d'une part, de communication humaine d'autre part, les recherches ont d'abord porté sur la rétroaction biologique (bio-feedback), puis la relaxation, les réflexes et la myothérapie, pour maintenant se concentrer principalement sur les problématiques de prévention psycho-sociale et d'alternatives éducatives aux algies lombaires chroniques. Sur le premier thème, l'UQAT a obtenu une subvention du CQRS. Sur le deuxième thème, un projet de coopération est en cours avec l'U.E.R. de médecine de l'Université Bordeaux II de France. Une demande de subvention pour ce projet a été indexée au FCAR, au CRSH et CQRS. Une demande devrait suivre à l'IRSST. Concernant les alternatives éducatives au problème des maux de dos, le Fonds FCAR subventionne également la parution d'un ouvrage.

Il est à noter que deux professeurs de ce secteur ont pu réaliser un post-doctorat, l'un avec le professeur Watzlawick, en communication à Palo-Alto et l'autre en psychologie transpersonnelle à Orinda (Californie).

Les sciences de l'éducation

Au-delà de la formation des maîtres dont l'UQAT, comme toutes les autres constituantes à vocation générale du réseau, s'est vue chargée, les sciences de l'éducation ont pu contribuer de façon significative à l'essor de la recherche.

Le domaine qui caractérise sans doute le mieux notre établissement dans ce secteur se trouve être celui du développement des services éducatifs dans les régions périphériques à faible densité de population (ce volet inclut le développement des services éducatifs chez les Autochtones).

A propos de la problématique plus particulière des petites écoles dans les milieux à faible densité de population, nous sommes financés depuis deux ans par le Fonds FCAR (équipes et séminaires).

Le deuxième programme important de recherche porte sur le développement de curriculum, principalement en enseignement professionnel, et implique la participation du Département des sciences appliquées. Le domaine des applications pédagogiques de l'ordinateur émerge progressivement. L'UQAT est membre d'un groupe multirégional de recherche au sein du réseau de l'Université du Québec.

Il faudrait ajouter à cela quelques publications sur les modèles et les styles d'apprentissage ainsi que des travaux en didactique du français.

Les sciences sociales

Le Groupe de l'expérimentation sociale en Abitibi-Témiscamingue axe principalement ses orientations et ses interventions sur des problématiques abordées sous l'angle de la recherche-action. Les principales recherches portent sur le développement régional, le développement des coopératives, la prise en charge chez les Amérindiens.

L'expérimentation sur l'accueil de groupe à travers tout le Québec a été confiée à ce Groupe par Travail-Québec. Le Groupe s'intéresse aussi aux divers modèles alternatifs d'organisation de l'activité sociale.

Les sciences de l'administration

C'est là un secteur où, traditionnellement, au Québec, l'accent portait plus sur la consultation que sur la recherche à proprement parler.

On assiste cependant, à l'UQAT, à un regain des activités de recherche qui accompagnent le developpement des études de 2e cycle.

Les principales thématiques retenues sont le phénomène de la PMO, le diagnostic-intervention et l'entrepreneurship féminin.

Les sciences appliquées

Il s'agit là du champ d'études et de recherche le plus récent à l'UQAT. Cependant, le corps professoral, composé de jeunes individus bien qualifiés ou en voie de le devenir, est très actif.

Les principales activités touchent les domaines suivants:

Les sciences et technologies minières

Dans ce secteur, on retrouve des recherches géologiques et des analyses pétrographiques (collaboration avec l'UQAT et le CAT, subvention FCAR), des recherches en mécanique des roches (étude du potentiel de coup de toit en collaboration avec l'UQAC et l'École Polytechnique de Montréal), des recherches sur la modélisation assistée par ordinateur (évaluation des gisements par la méthode géostatique avec graphisme interactif: subvention du CRM et du ministère de l'Enseignement supérieur, de la Science et de la Technologie).

L'UQAT concrétise la mise sur pied d'une Unité de recherches en sciences et technologies minières en collaboration avec le CAT et l'industrie minière.

Les sciences et technologies forestières

L'UQAT est membre du Centre multirégional de recherches en sciences et technologies forestières. Trois types de projets retiennent pour l'instant l'intérêt de l'UQAT: la régénération et la croissance des plants, l'amendement organique des sols avec les résidus de sciage, la santé et la sécurité au travail en milieu forestier.

La recherche opérationnelle et l'informatique

La thématique principale se trouve être la modélisation et l'aide à la décision avec, comme spécialité, l'analyse multicritère. Dans le secteur des sciences appliquées, nous allons concentrer nos efforts pour obtenir des subventions du CRSNG. Un nouveau chercheur spécialisé en physique (électronique et automatique) entrera en fonctions en janvier 1987.

Nous terminons par les groupes interuniversitaires autres que ceux déjà mentionnés ci-dessus. L'UQAT, par l'intermédiaire de professeurs des sciences du comportement humain, est membre du GRIP (Groupe de recherche interuniversitaire sur la prévention de l'inadaptation psycho-sociale). Les représentants de l'UQAT ont été très actifs dans ce dossier.

L'UQAT participe également au Groupe d'intervention et de recherche sur les systèmes d'activités humaines. Le Groupe et des membres du Groupe ont reçu des subventions du FCAR, du CRSH et du CQRS.

Le tableau ci-après décrit bien l'évolution de la recherche au cours des 12 dernières années.

Portrait global de la recherche subventionnée à l'UQAT (de 1972 à 1986)

Année	Nombre de chercheurs	Nombre de subventions	Nombre de projets	Montant $
1972-	2	3	3	34 960 $
1974-1975	8	9	8	42 250
1975-1976	10	10	10	34 965
1976-1977	12	13	13	34 165
1977-1978	13	13	13	28 595
1978-1979	19	23	23	29 349
1979-1980	21	26	25	316 236
1980-1981	33	55	54	586 710
1981-1982	22	33	32	384 554
1982-1983	20	30	27	308 345
1983-1984	21	28	25	472 542
1984-1985	33	57	48	712 531
1985-1986	28	54	50	944 490

En dépit de la faiblesse des ressources à la disposition des professeurs/chercheurs, il faut donc noter une progression remarquable. Sans qu'il y ait répartition égale entre tous les membres de la communauté professorale, il est à souligner le nombre de chercheurs impliqués et la moyenne générale de subventions par professeur, qui se situe autour de 16 000 $.

L'effort institutionnel de soutien des actions de perfectionnement (à court et long termes) et les actions reliées à la recherche plus directement totalisent une somme de plus de 250 000 $.

Le corps professoral

L'augmentation du nombre de programmes au cours des années a donné lieu à une augmentation du nombre des professeurs réguliers. Bien que relative, cette hausse du personnel enseignant illustre, à sa manière, la progression de l'Université dans son milieu, son insertion concrète et sa pertinence.

Pour l'année 1985-1986, le corps professoral régulier de l'UQAT se composera de 63 ressources, un ajout de 5 nouveaux membres par rapport à l'année 1984-1985. Entre 1978 et 1986, le corps professoral aura presque doublé.

Le tableau illustre l'évolution du nombre de professeurs réguliers, de 1976 à 1985.

Remarquons, en outre, que la moyenne d'âge du corps professoral régulier se situe aux environs de 36 ans. Bon nombre de professeurs détiennent un diplôme de deuxième cycle; cependant, un nombre qui tend à s'accroître d'année en année possède maintenant soit la scolarité de troisième cycle ou le doctorat complété. Il convient d'ajouter que les critères d'embauche de professeurs réguliers, depuis quelques années, stipulent que le candidat doit posséder une scolarité de doctorat et que, à défaut, il doit s'engager à réaliser de telles études comme condition d'entrée à l'Université. De la sorte, l'Université indique qu'elle veut maintenir des standards de qualification qui soient au plus haut niveau.

Le tableau suivant indique le taux de scolarisation du corps professoral régulier.

Taux de scolarisation du corps professoral régulier
(Selon le cycle du dernier diplôme obtenu)

	1979-1980		1980-1981		1981-1982		1982-1983		1983-1984		1984-1985	
	Nbre	%	Nbre	%	Nbre	%	Nbre	%	Nbre	%	Nbre	%
1er cycle	7	17,0	9	22,0	6	14,0	7	14,0	5	8,62	3	5,17
2e cycle	25	61,0	25	61,0	28	65,1	25	50,0	32	55,17	16	27,58
Sc. doctorat	9	22,0	7	17,0	5	11,6	14	28,0	14	24,14	24	41,37
3e cycle	—	—	—	—	4	9,3	4	8,0	7	12,07	15	26,86
Total	41	100,0	41	100,0	43	100,0	50	100,0	58	100,0	58	100,0

* Ce total inclut trois professeurs en sciences comptables dont l'expérience est telle qu'ils répondent aux critères d'embauche.

La consolidation et le développement

Dans une conjoncture économique difficile, les objectifs du plan triennal 1982-1985 ont très largement été atteints.

Pour la prochaine période triennale se terminant en 1988, la communauté universitaire doit s'efforcer de développer son efficacité sur un plan stratégique, en dépassant nettement le simple ajout quantitatif d'un ensemble d'objectifs, dans chacun des secteurs disciplinaires qui sont eux-mêmes en voie d'enraciner leur génie propre.

Les progrès réalisés et le dynamisme montré par les acteurs des développements prioritaires annoncés conduisent maintenant la communauté universitaire à réduire encore l'éventail originel des priorités manifestées.

Les notions de spécialisation et de marque distinctive de l'UQAT dans l'ensemble universitaire québécois ne doivent pas gêner la prise de conscience des développements possibles, ni pousser à des projections qui ne retrouveraient pas sur le terrain des conditions somme toute favorables à la satisfaction qualitative des attentes et besoins manifestés par la collectivité d'insertion de l'Université en Abitibi-Témiscamingue.

Considérant son analyse des besoins régionaux et ses capacités réalistes de développement au cours des prochaines années, l'UQAT s'estime en mesure d'affirmer, au-delà de la notion de développement prioritaire, que ses axes de développement pour les prochaines années seront les suivants:

1. La formation socio-éducative poussée des ressources humaines nécessitées par le développement spatio-temporel de l'habitat nordique.

2. La formation générale de type technico-scientifique des ressources humaines consacrées à la mise en valeur des ressources du sol, en particulier dans le secteur des technologies de l'industrie minière.

3. Le développement d'un potentiel de compétence scientifique et technologique d'aide aux domaines de l'agro-alimentaire, de la forêt et de la gestion de l'environnement.

L'UQAT énonce ainsi son intention de poursuivre ses efforts dans le développement qualitatif des ressources humaines engagées dans les secteurs sociaux de l'éducation et de la rééducation, du comportement humain, de la santé, des services sociaux, de l'administration, de la productivité économique et de la vie culturelle.

L'Université souligne par ailleurs, sa résolution d'accorder la priorité à la formation générale du type technico-scientifique comme instrument fondamental de développement du savoir scientifique dans le secteur de l'ingénierie et de la mise en valeur des ressources du sol, en particulier dans le créneau de la technologie de la prospection et de l'exploitation minières.

Conclusion

L'ensemble des éléments sur lesquels se fondent les choix de l'Université pour la prochaine période d'activité pose des défis difficiles. Les conditions de leur réalisation ont beaucoup

changé. Bref, il faut bien comprendre que les règles du jeu ne sont plus les mêmes et que, désormais, la gestion de la consolidation et de la croissance sera davantage axée sur la découverte d'avantages intrinsèques de l'établissement, et sur la mobilisation de toutes ses ressources, dans le but de conserver ou d'atteindre une position stratégique favorable pour l'Université du Québec en Abitibi-Témiscamingue.

En période de restrictions budgétaires, la planification et la gestion stratégiques en vue d'atteindre les objectifs visés dépendent surtout des ressources humaines. L'attitude et le comportement des intéressés constituent donc des facteurs déterminants.

ALLOCUTION AUX REPRÉSENTANTS DES QUATRE UNIVERSITÉS DU MOYEN-NORD

M. Jean Descarreaux
Président du Conseil d'administration de l'Université du Québec en Abitibi-Témiscamingue

C'est le 19 octobre 1983 que l'Université du Québec en Abitibi-Témiscamingue a été érigée en constituante du réseau de l'Université du Québec. Les paramètres d'évolution de cet établissement de haut savoir ont été intégrés à un plan de développement qui déterminait les grandes lignes et le détail des fonctions de l'Université dans sa région d'insertion, pour les années 1982 à 1985.

Le bilan que nous avons dressé, à l'issue du processus de planification stratégique qui allait suivre pour les années 1985 à 1988, a mis en évidence un certain nombre de données qui invitent à remanier les paramètres généraux d'évolution de notre université. Ces paramètres fondamentaux, pour une institution comme la nôtre, sont inscrits dans sa mission, ses orientations et ses axes de développement, qui prennent en compte évidemment les lignes générales adoptées en 1982. Cette définition doit par ailleurs tenir compte de l'expérience de l'université au cours des trois dernières années, ainsi que des éléments stratégiques d'évolution dans la communauté d'insertion de l'UQAT, et des besoins et attentes mis en évidence dans les regroupements disciplinaires internes et dans les différents secteurs de l'activité humaine externe à l'Université.

La mission

La définition de la mission de l'UQAT, dans son premier plan triennal, énonçait d'abord les caractéristiques distinctes de la région d'insertion de l'établissement, c'est-à-dire sa situation géographique, sa nordicité, l'étendu du territoire rural, la faible densité de la population et l'importance des ressources naturelles. Elle soulignait ensuite l'action de l'Université dans la formation des ressources humaines nécessaires à la mise en valeur

des richesses naturelles et à la gestion de l'environnement. Elle énonçait également l'intention de poursuivre les interventions actuelles, notamment en éducation, en administration, en sciences sociales et en sciences de la santé.

Les analyses effectuées par le Comité du plan de développement nous montrent très clairement qu'il faut assurer la continuité des lignes de force de l'action universitaire pour les trois prochaines années. Le bilan de cette action au cours des trois ans passés et l'évolution des attitudes développementales des populations du Moyen-Nord montrent cependant la nécessité de préciser la mission de l'UQAT.

Il est désormais manifeste que, dans la société post-industrielle occidentale, c'est le développement d'une infrastructure socio-éducative forte et intégrée au milieu ambiant qui fournit les meilleures conditions pour préparer les acteurs aux activités diversifiées du monde des années 1990. Le contexte régional de l'Abitibi-Témiscamingue n'échappe pas à cette tendance; la mission de l'UQAT doit en tenir compte et mieux préciser le rôle que l'Université entend jouer comme cheville ouvrière dans l'ensemble des facteurs déterminant l'avenir de cette région et de sa population.

L'UQAT met donc en évidence, pour les prochaines années, sa mission fondamentale d'enseignement et de recherche par référence à trois pôles de la dynamique régionale:

1. Une contribution dynamique des sciences de l'homme et de la société au développement des ressources humaines consacrées à l'organisation et au développement social, éducatif, culturel et économique du territoire.

2. La formation technico-scientifique des ressources humaines nécessaires à la mise en valeur des ressources du sol et à la gestion de l'environnement nordique.

3. Le développement d'infrastructures et de foyers de compétence pour étayer l'action des entreprises et des groupes participant au développement local et régional.

La traduction, dans l'action universitaire, des trois aspects de cette mission, à nouveau précisés pour la prochaine période triennale, réitère avec force la nécessité de reconnaître les besoins de la communauté régionale d'insertion comme facteurs déterminants des objectifs et des modes d'intervention de l'UQAT dans l'ensemble universitaire québécois.

Les orientations de l'UQAT pour les années à venir

Les orientations traduisent la volonté et la manière d'être de l'établissement universitaire dans sa communauté d'appartenance. En Abitibi-Témiscamingue, cela signifie concrètement des orientations qui tiennent compte des caractéristiques socio-démographiques de la population desservie, du développement des services universitaires, des directions de développement social, économique et culturel privilégiées par les intervenants des secteurs concernés, des contraintes externes et internes du réseau universitaire ainsi que des moyens mis à la disposition de la communauté scientifique universitaire pour réaliser sa mission.

De façon générale, trois principes guideront l'UQAT pour assumer sa responsabilité en Abitibi-Témiscamingue. Le premier principe, soit l'accessibilité de la communauté régionale

aux connaissances de niveau universitaire constitue sans aucun doute un élément fondamental. Le deuxième principe est la prise de conscience des ressources limitées d'une institution de petite dimension, et donc de la nécessité de s'appuyer sur la communauté scientifique du réseau de l'Université du Québec. Le troisième principe concerne la volonté manifeste de l'Université régionale d'accomplir ses missions en offrant une contribution concrète aux différents milieux régionaux, afin de mettre en place un certain nombre de programmes, de lieux ou d'actions structurantes pour le développement de la région.

En s'étayant sur ces principes, les orientations de l'UQAT pour la période de 1985 à 1988 seront donc les suivantes:

Premièrement, consolider le patrimoine académique de base de l'Université afin de valoriser la formation générale dans les sciences humaines, les sciences appliquées et le développement régional nordique.

Deuxièmement, renforcer la programmation des études de 2^{e} et de 3^{e} cycles et consolider les programmes actuels afin d'accroître leur efficacité.

Troisièmement, stimuler considérablement la formation d'équipes de recherche en faisant appel, en particulier, aux étudiants des cycles supérieurs et intensifier les collaborations scientifiques intra et extramuros.

Quatrièmement, intensifier de façon marquée les relations avec les milieux régionaux et québécois de développement des sciences.

Cinquièmement, créer, en collaboration avec les organismes concernés, des lieux de référence scientifique qui puissent servir de base à des initiatives structurantes dans la vie collective.

Sixièmement, systématiser l'élaboration d'une approche originale et bien adaptée des modes d'intervention de l'Université dans une région nordique, éloignée des grands centres, à faible densité démographique et située à un carrefour de cultures autochtones.

Les axes de développement

Considérant son analyse des besoins régionaux et ses capacités réalistes de développement au cours des prochaines années, l'UQAT affirme que ses axes de développement seront les suivants:

Premièrement, une formation socio-éducative poussée des ressources humaines consacrées au développement spatio-temporel de l'habitat nordique.

Deuxièmement, une formation de type technico-scientifique des ressources humaines nécessaires à la mise en valeur des ressources du sol, en particulier en technologies de l'industrie minière.

Troisièmement, le développement d'un potentiel de compétence scientifique et technique dans les domaines de l'agro-alimentaire, de la forêt et de la gestion de l'environnement.

Les développements envisagés

Les aspirations de la communauté d'insertion et du milieu institutionnel de l'UQAT suggèrent clairement la voie à prendre par cette Université pour la période triennale 1985-1988.

Son souci premier sera de marquer davantage, par le développement de son action aux plans de l'enseignement, de la recherche et des services à la collectivité, sa volonté de former les ressources humaines de la région de l'Abitibi-Témiscamingue pour la mise en valeur concertée des richesses naturelles de ce territoire. Plus précisément, il lui faudra accomplir un effort résolu pour développer la formation des personnes chargées d'utiliser les ressources communautaires de base pour l'organisation de la vie sociale de la région. De plus, la volonté de la communauté universitaire, en collaboration avec les entreprises régionales, est de mettre l'accent sur la formation et le perfectionnement technico-scientifiques des personnes qui ouvreront directement à la mise en valeur des ressources du sol.

La formation générale en sciences humaines au 1er cycle se traduira par l'inscription, dans le patrimoine académique, d'un programme de Baccalauréat général en sciences humaines, afin de répondre adéquatement à la nécessité sociale de donner une formation de base aux personnes qui auront à étayer l'organisation communautaire d'une société. Ce programme devrait également déboucher sur des programmes de 2e cycle dans des champs d'études plus restreints (par ex.: programme de Maîtrise en intervention psychosociale).

La formation de type technico-scientifique sera assurée par l'insertion dans la programmation de notre Université, et de concert avec d'autres établissements universitaires, d'un programme général de formation en génie. Ce programme de base unifié en génie serait assorti d'une concentration terminale qui devrait être axée sur la technologie de l'exploitation minière (mécanique des roches, conception assistée par ordinateur de l'exploitation, etc.).

Notre établissement se penchera également sur la problématique d'un programme général de formation en sciences qui évitera la spécialisation prématurée, et l'écueil d'un faible bassin démographique.

Un autre élément majeur du développement de l'enseignement sera l'introduction, en collaboration avec l'UQAM et les autres constituantes à vocation générale du réseau de l'Université du Québec, d'un programme de 3e cycle en pédagogie. Les efforts que l'Université du Québec a consacrés à la formation des maîtres depuis 15 ans, et le bassin de ressources professorales compétentes qu'elle a développé pendant cette période laissent entrevoir un avenir prometteur de ce côté.

Au niveau des études avancées toujours, les responsables des sciences du comportement humain de l'Université se concerteront avec l'UQTR, l'UQAH et l'UQAR pour mettre sur pied un programme de Maîtrise en prévention et intervention psychosociales. Les analyses préliminaires indiquent l'à-propos de la création d'un tel programme, d'autant que les compétences professorales en ce domaine sont adéquates. Dans ce même secteur, on prévoit la mise sur pied de «blocs» supplémentaires de cours portant sur la condition des femmes, la psychologie transpersonnelle en éducation et rééducation, la sexologie et la thanatologie.

Dans le secteur des sciences sociales et de la santé, on s'efforcera d'élaborer un programme en planification locale et régionale dont l'une des caractéristiques fondamentales serait la problématique du développement en milieu nordique.

En sciences administratives et comptables, on adaptera plus exactement le contenu du programme de Baccalauréat en administration aux besoins du milieu régional (mines, forêt, agro-alimentaire et énergie) et on mettra sur pied un Certificat de 2e cycle en fiscalité.

Le domaine des arts et des lettres serait marqué, lui, par une révision de la formation spécialisée en arts plastiques, afin de lui conférer quelque affinité avec la production littéraire. On s'efforcerait donc d'associer les champs de la production en arts plastiques et en littérature.

Les sciences de l'éducation se préoccuperaient de la formation des maîtres au secondaire et en milieu autochtone, ainsi que tout le champ du développement des services éducatifs en milieu à faible densité démographique, avec un souci particulier pour l'administration scolaire.

Au plan de la recherche, on se préoccupera au premier chef de la formation des chercheurs et de la création d'équipes ou de groupes de recherche sur les problèmes qui se posent dans la communauté d'insertion de l'UQAT. La formation d'une masse critique de professeurs diplômés de 3e cycle nous permet d'espérer des progrès majeurs, mais il nous faut prendre en considération l'ampleur restreinte des ressources humaines de notre Université et les différentes missions qu'elle doit également remplir.

Les Services à la collectivité de l'Université se proposent de mettre sur pied un nouveau mode de liaison avec les organismes et les entreprises de la région. Cette volonté de satisfaire, dans la mesure du possible, les besoins autres que ceux de la formation avec diplôme devrait déboucher sur l'élaboration d'une politique générale d'encadrement adéquat de ce Service en région périphérique.

Conclusion

Nous avons exposé ci-dessus, dans ses grandes lignes, la situation de l'Université du Québec en Abitibi-Témiscamingue, en tant que constituante du réseau de l'Université du Québec créé par le Conseil des ministres, en conformité avec les dispositions de la Loi de l'Université du Québec.

Le développement de cet établissement universitaire a connu des périodes difficiles. Le bilan des réalisations et les résultats obtenus, au cours des quatre dernières années, mettent cependant en relief une progression quantitative et surtout qualitative de ses interventions. Les accords de collaboration au plan de l'enseignement et de la recherche montrent éloquemment que les autres universités du Québec le reconnaissent actuellement comme un partenaire de niveau équivalent.

Les ressources humaines et matérielles dont dispose maintenant l'Université du Québec en Abitibi-Témiscamingue, quoique fort réduites, constituent quand même une base solide pour réaliser les projets qu'elle a conçus depuis quelques années. La présence d'une

université dans une région nordique faiblement peuplée présente un défi de taille que la communauté universitaire de l'Abitibi-Témiscamingue et du Nord du Québec entend relever avec, comme objectif fondamental, la poursuite de l'excellence.

La mission de l'UQAT, les orientations des services univesitaires et les axes de développement posent inévitablement le défi de l'excellence qui doit être la caractéristique de nos interventions. Les acteurs chargés de la relever devront consentir tous les efforts nécessités par son importance.

La deuxième phase de développement de l'Université du Québec en Abitibi-Témiscamingue se déroulera donc sous le triple signe de la concertation, de la solidarité avec la population régionale et de l'engagement sans réserve à servir la région avant tout.

LES COLLECTIONS DOCUMENTAIRES LOUIS-EDMOND HAMELIN ET DE LA SOCIÉTÉ DE LA BAIE JAMES

Serge Allard
Université du Québec en Abitibi-Témiscamingue

Résumé: La collection de documents de la Société de la Baie James comprend surtout des rapports scientifiques sur l'étendue du territoire couvert par les aménagements hydro-électriques de cette société. Elle compte environ 11 000 monographies en plus des périodiques, de milliers de photos, cartes, diapositives, etc., et inclut aussi une banque de données automatisée.

La collection Louis-Edmond Hamelin est celle d'un géographe de carrière qui s'est toujours intéressé aux régions nordiques, et surtout au Nord canadien.

Abstract: The collection of Baie James Corporation documents mainly comprises scientific reports on the entire territory covered by the company's hydro-electric projects. It includes some 11,000 monographs and journals, thousands of photographs, maps, slides, etc. and a digitized data bank.

The Louis-Edmond Hamelin collection is that of a career Geographer who has a lifelong interest in the North, especially the Canadian North.

C'est à l'automne de 1984 que l'Université du Québec reçut la collection de documents de la S.D.B.J. (Société de la Baie James), fondée par le gouvernement du Québec pour l'aménagement du complexe hydro-électrique de la Baie James.

La composition de cette collection apparaîtra plus clairement quand nous aurons précisé les objectifs de la S.D.B.J.

Outre la construction des barrages proprement dits, cette société devait voir à la préparation des projets et étudier les incidences des aménagements sur l'environnement. A cette fin, elle engagea jusqu'à 200 scientifiques pour faire l'étude du territoire, sous tous ses aspects.

Elle répartit ce territoire en 41 000 parcelles dont chacune fit l'objet d'études pour le recueil des données pertinentes.

Les hydrologues menèrent donc des recherches dans une vingtaine de stations hydrométriques réparties dans un territoire dont 20 pour cent est couvert d'eau, en vue d'évaluer les quantités et la qualité des eaux dans les rivières et 173 lacs.

Les plantes aquatiques, le phytoplancton, le zooplancton, les insectes, les poissons, ainsi que leurs caractéristiques nordiques, furent l'objet d'études et de rapports, de même que le climat, dans 45 stations climatologiques.

Puis vint l'étude des oies, des canards et des petits animaux, en particulier le castor, dont les habitats risquaient d'être détruits par la montée des eaux. On étudia aussi l'orignal et le caribou.

Même les fonds marins et la faune marine n'échappèrent pas aux études. En particulier, la télédétection par satellite fournit à la collection de documents 1 500 photos Landsat complétant les 7 000 photos aériennes en couleurs ou infrarouge.

De plus, la collection inclut environ 15 000 photographies du territoire en noir et blanc et en couleurs et près de 4 000 diapositives.

L'utilisation aisée de cette documentation nécessitait son informatisation, ce qui fut fait grâce aux 240 000 fiches d'inventaire décrivant les 41 000 parcelles étudiées, aux cartes hypsométriques reproductibles sur écran et aux 20 clefs d'interprétation associables aux descripteurs bibliographiques.

A ces rapports et données informatisés, il faut ajouter les documents de référence déjà publiés sur le sujet et que la S.D.B.J. a rassemblés avec soin: livres, revues ou documents officiels, de même que les appareils de consultation et les étagères pour les disposer.

A cette collection de 11 000 monographies plus le reste, il ne faut pas oublier d'ajouter des milliers de cartes à toutes échelles; couvrant tout le territoire, et de nature thématique ou simplement topographique.

Je ne parle pas ici des manuels ou périodiques nécessaires à la création et à l'exploitation d'une telle entreprise.

Enfin, il faut mentionner que la S.D.B.J. a cru de son devoir de faire des recherches archéologiques dans ce territoire, d'étudier les caractéristiques ethnographiques des Autochtones et de donner son idée sur les perspectives économiques de l'électricité, des forêts et des mines, et des possibilités récréatives du même territoire.

Canada's Subarctic Universities/Les Universités Canadiennes du Moyen Nord

Cette collection est partiellement (aux trois quarts pour la documentation imprimée) incorporée dans notre réseau documentaire automatisé, soit Badaduq, accessible à tout intéressé par une porte INET de Bell Canada.

A cette collection que je viens de décrire, notre université a ajouté celle que M. Louis-Edmond Hamelin a recueillie sur le Nord, et qu'il lui a aimablement transmise.

M. Hamelin est un géographe qui a été recteur de l'UQTR, et qui a toujours accordé beaucoup d'intérêt au Nord. Outre ses activités au cours de l'Enquête Berger dans le Nord-Ouest, il a participé au gouvernement de ces territoires et aux travaux de la commission pour l'application de la Convention de la Baie James avec les Autochtones.

Sa collection contient une documentation de base sur le Nord, de même que de nombreux périodiques et quelques pièces rares.

Nous y trouvons aussi des descriptions et études en plusieurs langues sur le Nord en général, ainsi que sur l'Antarctique.

Elle contient environ 500 documents imprimés.

Cette collection (sauf les périodiques) est entièrement incorporée dans notre réseau documentaire automatisé, soit Badaduq, accessible à tout intéressé par une porte INET de Bell Canada.

Il faut aussi mentionner les activités de la S.E.B.J. (Société d'Energie de la Baie James) qui a publié des documents touchant en particulier aux barrages et aux bassins de retenue. Elle a recueilli un grand nombre de cartes et a fait, en particulier, plusieurs fouilles archéologiques dans les sites à inonder. Elle a d'ailleurs publié un atlas de ces sites.

Tous ces documents énumérés ici sont accessibles à l'U.Q.A.T., et c'est avec plaisir que nous vous en ferons profiter s'ils peuvent vous être utiles.

L'UNIVERSITÉ DU QUÉBEC EN ABITIBI-TÉMISCAMINGUE EN MILIEU AMÉRINDIEN

Micheline Potvin
Université du Québec en Abitibi-Témiscamingue

Résumé: L'Université du Québec en Abitibi-Témiscamingue, par le biais de ses Services à la collectivité, met à la disposition des bandes algonquines de la région des ressources humaines et matérielles pouvant répondre à leurs besoins particuliers.

C'est ainsi qu'ont été réalisées sur place 28 interventions sous forme de cours ad hoc et de 6 brèves études. De plus, les Algonquins des réserves de Pikogan et du Lac Simon continuent d'oeuvrer de concert avec une animatrice communautaire qui les aide à la demande.

Abstract: L'Université du Québec en Abitibi-Témiscamingue, through its services to the general public, places at the disposal of the Algonquin band of the region, human and material resources able to respond to their particular needs.

In this way, it has been possible to develop 28 activities in the form of ad hoc courses and 6 short studies. Further, the Algonquin of the Pikogan and Lac Simon reserves continue to work together with a community animatrice who assists them when asked.

Je devais vous parler aujourd'hui de l'intervention en milieu scolaire accomplie par certains de mes collègues au Moyen-Nord.

Après avoir largement discuté avec eux, nous avons décidé d'attendre encore. Notre présence dans ce milieu ne remonte qu'à deux ans, et nous avons promis d'y rester discrets. Nous espérons que, dans quelques temps, les Inuit eux-mêmes viendront vous parler de cette collaboration.

Je vais donc profiter du temps qui m'est alloué pour vous parler de ma propre intervention, par le biais des Services à la collectivité; elle se déroule en collaboration avec un de mes collègues du département des Sciences sociales et de la santé et qui devait être ici aujourd'hui, Jean-Pierre Marquis.

L'aventure a commencé en janvier 1982, moment où le Conseil de bande du Lac Simon s'est réuni en assemblée générale avec tous les habitants de la Réserve pour décider de ses orientations et pour savoir ce qu'ils connaissaient des services offerts par les comités au Conseil de bande.

À la demande des assistants, le chef Jean Papatie fut mandaté pour rencontrer l'Université et voir quels services cette dernière pouvait offrir en matière de formation ad hoc, d'organisation, de planification, de prise de décisions et de progrès social. Plus tard, on envisagera les problèmes de développement économique.

Le responsable des services à la collectivité chez nous, Monsieur Jean Turgeon, me demanda à l'hiver 1982 de les rencontrer et de voir quels besoins l'UQAT peut satisfaire.

Pourquoi les Algonquins se sont-ils adressés à l'UQAT?

Il se trouve que le réseau des Universités du Québec, à cause de son orientation vers les services à la collectivité, constitue l'institution la mieux placée dans ce genre de milieu pour répondre aux besoins des petits groupes (2-8 personnes), quand elle possède les ressources départementales compétentes et accessibles. En effet, les autres organismes, telles les commissions scolaires, sont régis par des normes administratives qui ne leur permettent pas de répondre aux besoins des Autochtones.

C'est ainsi que notre département a entrepris de participer à la formation de plusieurs groupes, de l'Animation du travail en groupe à l'Informatique et aux Techniques audio-visuelles. Des techniciens de l'UQAT se sont retrouvés instructeurs. . . et ont aidé, par exemple, des Algonquins disposant d'une camera et d'un équipement magnétoscopique complet, mais ne sachant pas s'en servir, à les utiliser.

Nous avons continué notre travail d'assistance au Lac Simon jusqu'à maintenant par le truchement d'une étudiante en Animation qui y a accompli un stage et qui y travaille encore comme aide à l'équipe d'Animation communautaire sur place.

De cette façon, nous sommes intervenus aussi à Pikogan, près d'Amos, et à Winneway, à Notre-Dame du Nord, au Témiscamingue. Ici un collègue, Alain Whissell, donnait la formation en anglais. En tout, 28 plans de formation ad hoc ont été mis sur pied et réalisés, de même que 6 courtes études sur les bandes algonquines, leur territoire et leurs caractéristiques démographiques, quelques projets de développement économique et la formation secondaire et collégiale, puis une démarche d'animation communautaire qui se continue.

Mentionnons en particulier la formation à la participation et à la prise de décisions que nous avons donnée pendant l'hiver de 1983 au Conseil de bande de Pikogan. Molly Mowatt, directrice de l'école élémentaire, et moi-même avons mis sur pied et donné une formation en algonquin, seule langue connue par la plupart des auditeurs, les uns étant anglophones et les autres francophones. Même à ce moment-là, il fallait utiliser le français pour les deux conseillers dans la vingtaine qui ne connaissaient ni l'anglais, ni l'algonquin.

Certains groupes sont nés, tel un groupe de femmes amérindiennes, lesquelles ont pu rencontrer d'autres femmes dans la même situation, mais vivant dans le Nord de l'Europe.

Finalement, c'est maintenant vers la recherche appliquée que se tourne le département des Sciences sociales. Les besoins sont grands mais les ressources limitées, et c'est avec les Amérindiens de chez nous que nous déciderons des priorités. Déjà, il semble évident que le domaine des recherches socio-économiques est l'un de ceux où les besoins en sciences appliquées apparaissent le plus clairement.

ECONOMIC RELATIONS STUDY BETWEEN THE NORTH AND THE SOUTH

Romeo Saganash
USTIO and Université du Québec en Abitibi-Témiscamingue

Abstract: The Crees of Northern Quebec, signatories of the James Bay and Northern Quebec Agreement, have encountered severe difficulties in securing the proper implementation

of the Agreement, notably section 28 dealing with Cree economic development. Obligations of both governments — Quebec and Canada — have not been fulfilled.

However, the Crees of Northern Quebec have a significant influence and impact on the economic well-being of Val d'Or, the Abitibi-Témiscamingue region, and the rest of the province. USTIO therefore undertook its study to measure the extent and significance of the Cree presence.

Résumé: Les Cris du Nord québécois, signataires de la Convention de la Baie James et du Nord québecois, se sont heurtés à de très sérieuses difficultés lors de la mise en application de cette Convention et notamment de son article 28 qui traite du développement économique chez les Cris. Les deux paliers de gouvernement, fédéral et québécois, n'ont pas rempli leurs obligations.

Cependant les Cris du Nord québécois disposent d'une influence certaine et leurs activités ont de l'importance pour la santé économique de Val d'Or, de la région de l'Abitibi-Témiscamingue et du reste de la province. C'est pourquoi l'USTIO a entrepris une étude pour évaluer l'ampleur et l'importance des activités des Cris.

Introduction

It was with pleasure that I welcomed this opportunity to appear before you today and to speak about my land, my people, the North. The ACUNS Mid-North Universities Conference gives me the opportunity to outline the issue of economic development in Northern Quebec.

When we mention Northern Quebec, we naturally think of the Cree; when we mention the Cree, we think of the James Bay and Northern Quebec Agreement; and when we mention the James Bay and Northern Quebec Agreement, we immediately think of the severe difficulties the Crees still encounter in securing the implementation of Chapter 28 of the Agreement related to economic development.

It was with this particular thought in mind, economic development for the Crees, that we undertook our study in order to demonstrate the significance of the Cree presence in the neighbouring regions of Northern Quebec.

USTIO

For some time now, the economic milieu has had an increasing interest for the boundless northern territories above the 49th parallel. This interest originates from the development of the Hydro-Electric resources of James Bay and its native communities residing in the territory.

The Abitibi-Témiscamingue region, geographic neighbour of the North, benefits from an important economic fact: it supplies a wide range of services and products to the northern communities. In an era of fragile economic recovery, a new trend for Abitibi-Témiscamingue regional development has emerged: Nordicity.

The openness toward and interest in the phenomenon of Nordicity is ever present, and, indeed, there is a growing interest in being a "Northern Specialist". However, the implications of a northern intervention are misunderstood. The expertise on the subject to date is limited. The physical and cultural environment is different from what many perceive it to be. The land is not empty and its people have an enormous affection for the land and its resources. The North is not simply "a grim wilderness, empty and virtually useless except for its power and resource potential" as Bourassa would describe it.

It was therefore in a spirit of conformity to the present context and openness toward the future that the USTIO Consulting Group was created in 1985.

Our organization offers consultation services as well as the preparation of planning and technological transfer programs for the northern populations. USTIO also wishes to enhance its knowledge of northern intervention and consequently, wishes to be a tool for the establishment of better relations between the North and Abitibi-Témiscamingue.

The Study

The primary intent of the study was to measure the commercial relations between Abitibi-Témiscamingue and the North; approximately "how much" the Crees spend annually in Val d'Or, in Abitibi-Témiscamingue, and the rest of the province. Northern Ontario was even considered in some areas.

Naturally, it was important to describe and analyze the nature and the impact of the economic relations. The questions raised were: in what areas do the Crees spend most; what are the spin-offs of such relations; what is the employment impact; what is the economic impact?

After answering these questions, we will attempt to examine the perspectives of future development that the northern market offers for the Abitibi region. The identification of products and of services that are provided by other regions will be utilized for this purpose.

And finally, we will examine the possibilities of establishing "partnership" relations between the North and the Abitibi-Témiscamingue region. We have observed that joint development has become more and more the trend for development of the North.

Problems

Notwithstanding specific reviews which are being carried out on certain sections, all major parts of the James Bay and Northern Quebec Agreement are in place, with a notable exception: Section 28, dealing with economic development. Obligations of both the Government of Canada and the Province of Quebec with respect to the letter and spirit of Section 28 of the Agreement remain unfulfilled. No comprehensive approach has been taken towards the implementation of successful economic development in the Cree Territory. For the Cree communities, the resources available for the development of local businesses and economic enterprises are in certain respects similar to what they were in the pre-Agreement period. Funding and other financing for economic development remains largely a year-to-year arrangement and on a project-by-project basis. This makes the articulation and implementation of long-range planning an extremely difficult undertaking.

Although the Crees have demonstrated remarkable success in the economic ventures in which they have thus far entered, notably the Crees' Airline (Air Creebec) and the construction company (Cree Construction Company of Quebec), as well as some community-based enterprises, resources for community-based economic development have not been present in sufficient quantities and form for there to occur any substantial economic take-off.

The responsibilities of both governments as expressed in the James Bay and Northern Quebec Agreement are to assist in providing the conditions which are necessary for successful economic development to take place. The Crees thereby argue that the implementation of Section 28, which was meant to be "a blueprint for new economic and social programs, services and undertakings for the Cree which would allow them to participate in the development of Northern Quebec", has been an unqualified failure.

So it must be recalled that among the important objectives of the James Bay and Northern Quebec Agreement for the Crees were the protection of the traditional way of life and the option to benefit fully from the modern industrial society. Section 28 of the Agreement was the vehicle designed to allow the Crees to achieve economic independence.

The Crees further contend that their goal is economic self-sufficiency, with a viable local economy. The vast potential can best be exploited by the permanent population. Consider such sectors as forestry, mining, tourism, industry and commerce, and you will begin to recognize the significance of the future development in Cree territory.

It is difficult, however, to realistically contemplate development in any of these sectors without a significant economic infrastructure. Many communities have only two outside telephone lines. Most coastal Cree communities have no road access, no port facilities, and only recently rudimentary airstrips were built.

Many who have analyzed the situation have stated that the expenditure necessary for the development of a viable economy in the North exceeds the economic potential of the region. They forget that funds spent in the North which promote the development of a northern economy also create jobs in the South. This fact has received insufficient attention.

In December 1984, Canada and Quebec entered into an Industrial and Regional Development Master Agreement (IRDA). Although this agreement should have included specific references to Section 28 of the James Bay and Northern Quebec Agreement, *it did not*. The agreement signed between Canada and Quebec contains no reference to the Northern Quebec region nor to native economic development, nor does it consider the outstanding obligations of both governments in the James Bay and Northern Quebec Agreement.

Some Results

However, the absence of government participation to date in Cree economic development has not prevented the Crees from making progress on their own or jointly with other private corporations.

Since the time of the signing of the James Bay and Northern Quebec Agreement in 1975, the Crees have been remarkably successful in putting into place a wide range of service delivery structures at both the community and regional levels.

At the same time, in the course of taking over the responsibility for the delivery of key essential services to the Cree communities, a huge beneficial impact has been felt in the entire Northern Quebec region. Since 1975, the Crees have administered agencies whose combined budgets have totalled nearly three-quarter billion dollars, while creating employment for over 1200 people, including both natives and non-natives.

At the present time, even without the implementation of Section 28, we have noticed that the Crees have a significant influence on the economic well-being of Abitibi-Témiscamingue and Northern Quebec. Cree activities from administration to construction involving the Cree Regional Authority, the Cree School Board, the C.B.H.S.S.J.B., the Cree Construction Company Ltd., and Air Creebec inject millions of dollars into the local economy annually. These Corporations and Bands total combined budgets of over 70 million dollars annually. The eight Cree Communities with their Band administration and local enterprises allocate approximately 46 million dollars in salaries at the local level alone. Furthermore, the Crees have financed 8 million dollars worth of projects in the past year.

The economic activity, directly attributable to Cree presence in the region, is responsible for the maintenance of thousands of jobs in Quebec and elsewhere.

From the point of view of economic sectors in which there is important involvement by the Cree communities, traditional pursuits remain the most significant. Overall, involvement in the Income Security Program amounts to over 1700 individuals (receiving direct program benefits) out of a total Cree labour force of approximately 2900, or 59%. In view of the number of people involved in and the economic importance of traditional pursuits to the Cree communities (with an equivalent cash value estimated at as much as an additional 25% of the cash income), one must consider that the Crees now have, and will continue for the foreseeable future to maintain, a very important tie to the environment and to the natural resources of the Cree territory upon which they rely.

Université du Québec en Abitibi-Témiscamingue

MÉTHODE D'ENSEIGNEMENT DE LA LANGUE INUIT (NOUVELLE ORIENTATION DANS L'ENSEIGNEMENT DES LANGUES AUTOCHTONES)

Dolorès Ortiz
Université du Québec en Abitibi-Témiscamingue

Résumé: L'auteure estime qu'il faudrait développer l'enseignement des langues autochtones à des universitaires de diverses spécialisations, en fonction de leurs objectifs. Cet enseignement devrait permettre aux spécialistes qui, en nombre grandissant, oeuvrent avec les Autochtones, de pouvoir communiquer avec eux dans leur langue.

Il faudrait que l'enseignement des langues autochtones, en tant que langues de communication dans le Nord du pays, suive une nouvelle orientation. Celle-ci devrait tenir compte, en particulier, des trois considérations suivantes:

— La communication orale doit devenir le premier objectif de l'enseignement de ces langues;

— Le matériel didactique utilisé doit être axé sur les méthodes d'expression et de vie actuels;

— L'enseignement doit être confié à des Autochtones sous encadrement pertinent.

En ce qui concerne la langue inuit du Québec, un matériel didactique vient d'être élaboré en étroite collaboration avec deux Inuit. Il prend la forme de dialogues et de récits dont le contenu reflète des situations vraisemblables de la vie actuelle des communautés inuit du Québec. Il pourrait être utilisé pour un cours d'éducation permanente en milieu universitaire ou en milieu inuit.

De plus, la présence d'Inuit et la prise en charge de l'enseignement de leur langue par une université du Moyen-Nord permettraient d'envisager la création d'un programme permanent d'activités en langue inuit.

Abstract: The author believes that the teaching of Native Languages at various types of university must be developed in such a way as to contribute towards each institution's particular objectives. Such teaching will allow the increasing number of specialists who work with Native people to communicate with them in their own language.

It is necessary that the teaching of Native languages, the languages of everyday communication in the North, be approached anew. The new approach must, in particular, take into consideration the following:

— that conversation be its primary objective

— that teaching materials be based on current forms of expression and present-day life

— that instruction be by Native persons.

With regard to the Inuit language in Québec, teaching materials are being developed in close cooperation with two Inuit. These take the form of dialogue and accounts based on realistic situations from everyday life in Québec Inuit communities. These materials can be used in a university setting or in a local Inuit setting. Further, the presence of Inuit and the formal involvement of a Middle North university in Inuit language teaching make it possible to envisage a permanent program of studies in the Inuit language.

Considérations sur l'apprentissage des langues autochtones

On peut en général affirmer que, dans le passé, l'apprentissage des langues autochtones a été réservé à un nombre plutôt restreint d'intéressés. Ceux-ci, à l'exception des missionnaires qui passaient leur vie avec les Autochtones, étaient des spécialistes en anthropologie, ethnologie, linguistique ou autres disciplines universitaires.

Pour eux, la connaissance des langues autochtones était un moyen d'appréhender le véritable objet de leurs études, et tout autre que la simple communication avec la société autochtone en cause.

Tout naturellement, l'enseignement de ces langues a été réservé à l'université, dans le cadre des programmes de l'une ou l'autre des disciplines que je viens de mentionner.

Ce fait, bien entendu, n'a pas favorisé l'utilisation des langues autochtones comme langues de communication et d'expression des sociétés nordiques dans le cadre des réalités présentes.

De nos jours, bien que la présence des Autochtones devienne de plus en plus visible, s'étalant périodiquement sur l'écran de l'actualité nationale, on constate qu'il n'en a pas résulté un intérêt grandissant pour l'étude sérieuse de leurs langues.

Cela surprend quand on considère que le nombre des Blancs ayant des contacts prolongés avec les Autochtones dans le cadre de leur travail, en milieux tant occidental qu'autochtone, a augmenté considérablement pendant les dix dernières années, particulièrement au Nouveau-Québec.

Nous voyons que des spécialistes Blancs, par exemple, choisissent d'oeuvrer en milieu inuit et se trouvent donc dans des conditions très favorables à l'apprentissage de la langue inuit. En particulier:

- ils manifestent au début le désir d'apprendre cette langue, allant même jusqu'à s'inscrire à des cours successivement organisés à leur intention;

- ils font de longs séjours en milieu inuit, allant de 12 mois à dix ans et plus;

- ils sont en contact constant avec des Inuit dans le cadre de leur travail;

- ils sont accueillis de façon plus que chaleureuse, et ils se trouvent plongés dans une société où la communication interpersonnelle se fait sans entraves.

Et pourtant, malgré ces excellentes conditions, le découragement les prend dans la plupart des cas, avant que des résultats tangibles puissent se manifester.

Quelles pourraient bien être les *causes* de cette diminution graduelle du désir initial d'apprendre une langue, aboutissant souvent à un blocage insurmontable?

Nous en voyons deux principales: la première est d'ordre *psychologique*, la deuxième d'ordre purement *pédagogique*.

Parmi les facteurs d'ordre *psychologique*, je vais seulement en mentionner deux:

- la position de prétendue supériorité où ils peuvent se retrancher facilement, en tant qu'"envoyés" ou représentants des organismes officiels du pays;

- l'environnement physique et humain inhabituel de la vie en milieu arctique, et un sentiment puissant, quoique, inavoué, de dépaysement et d'insécurité, qui pousse souvent les gens à ne pas surmonter une barrière culturelle bien réelle.

Ces deux facteurs font souvent obstacle à une attitude d'ouverture d'esprit, de curiosité et de respect profond, conditions nécessaires à l'apprentissage de la langue et de la culture en question.

Le glissement vers une attitude de fermeture envers les gens et le milieu se fait très facilement. On est alors tenté de vouloir *changer* le milieu et les habitudes des gens par un travail zélé, plutôt que de chercher des voies qui favoriseraient *l'échange*.

Quant aux facteurs d'ordre *pédagogique*, ils sont plus faciles à décrire.

On peut simplement souligner qu'il n'existait pas de matériel didactique pour l'apprentissage de la langue inuit par le truchement de la *conversation*, et traitant de la vie présente dans les communautés inuit du Nord du Québec. C'est là tout ce qu'un spécialiste Blanc voit et perçoit de prime abord de la vie inuit.

Il n'existe pas non plus de professeurs Inuit suffisamment entraînés et disposés à enseigner leur langue comme langue seconde au cours d'une période limitée.

Élaboration d'une méthode d'apprentissage de la langue inuit

Naguère, la personne qui voulait apprendre la langue inuit devait fournir bien entendu l'effort intellectuel nécessaire à cet apprentissage. Elle était, de plus, contrainte d'adopter un mode de vie bien différent du sien, et souvent dans des conditions particulièrement difficiles.

Cette expérience de vie était des plus enrichissantes, mais ne pouvait être à la portée de tout le monde.

À l'heure actuelle, cependant, une telle démarche n'est plus nécessaire. Il nous semble que la participation à une vie sociale paisible, le partage du travail quotidien, les liens constants et les échanges fréquents entre le Nord et le Sud créent des conditions bien plus faciles pour l'apprentissage de la langue vernaculaire pour ceux qui s'y intéressent et consentiraient l'effort nécessaire.

C'est en tenant compte de ces considérations et des conditions actuelles de vie des Inuit que deux Inuit et moi-même avons travaillé à l'élaboration du matériel didactique (en deux livrets) d'initiation à la langue que nous avons appelés **UQARIURSAUTIIT** (Conversation inuit 1) et **ATUAGASSAIT** (Lectures inuit 1).

Il s'agit d'un matériel d'enseignement de la langue inuit visant un *but* bien précis: permettre à des spécialistes occidentaux, oeuvrant en milieu inuit ou destinés à travailler avec des Inuit, d'établir une communication dans leur langue, afin d'obtenir un meilleur contact. L'expérience de vie et de travail s'en trouverait nettement améliorée.

Notre premier *objectif pédagogique* est donc d'aider les candidats éventuels à surmonter le plus rapidement possible leur blocage linguistique en leur permettant de parler dès le début.

A cette fin, dans un premier temps, nous avons écrit des *dialogues* (et des *lectures* dans le deuxième livret) tout à fait vraisemblables, et couvrant des situations de la vie réelle que les habitants des communautés nordiques connaissent quotidiennement.

L'étudiant débutant aura ainsi la possibilité, — et cela dès le premier jour, — d'utiliser ce qu'il apprend au fur et à mesure, et il aura également plus de chances de saisir assez vite le contenu des dialogues réels dans des situations qu'il pourrait être appelé à vivre, en tant qu'acteur et spectateur.

En plus d'apprendre des phrases du dialogue qui véhiculent un contenu pouvant être immédiatement utilisé, parce qu'adapté à des situations bien ordinaires et concrètes, l'étudiant débutant prend progressivement conscience de la structure de la langue. A cet effet, nous l'amenons à *reconnaître des formes grammaticales* dans le dialogue de chaque leçon et qu'il est à même d'utiliser par la mémorisation préalable des questions et des réponses proposées.

Ces indications grammaticales[1] l'aideront à reconnaître immédiatement et à assimiler aisément les structures grammaticales de base, et lui permettront de s'habituer graduellement à un mode différent d'expression linguistique, voire de processus mental.

Le deuxième *but* que nous avons poursuivi, c'est de permettre aux Inuit d'utiliser notre matériel pour l'enseignement systématique de leur langue comme langue seconde dans le cadre d'un cours.

Pour cela, il nous a fallu répondre à certaines exigences sur le plan du *contenu* et de la *forme* de nos textes.

Au niveau du *contenu*, notamment, il a fallu que le contenu de nos conversations et de nos récits colle à la réalité présente, autrement dit qu'il paraisse authentique; que la langue ne soit pas délibérément simplifiée et que la démarche des personnages et la suite des événements concordent avec le mode de pensée des Inuit.

Ces exigences, quoique légitimes, ne sont pas toujours faciles à respecter entièrement, compte tenu de la difficulté de la langue inuit pour l'Occidental, et des différences culturelles.

A titre d'exemple, et pour vous montrer les conséquences du non-respect de ces normes, je vais vous raconter un des nombreux incidents survenus pendant notre travail, illustrant bien cette différence culturelle.

Dans un de nos *récits*, deux chasseurs Inuit partent pour un long voyage de chasse et de pêche. Après s'être levés avant l'aube, ils escaladent des montagnes pour atteindre la rivière, pêchent toute la journée sous la glace, chassent et dépècent deux caribous, construisent un igloo pour y passer la nuit, etc. . . . j'en passe.

J'avais proposé qu'on achève le récit par une phrase à peu près comme ceci: «Très fatigués, ils se couchent. . .» La «fatigue», en plus d'être un mot important, me paraissait une sensation tout à fait justifiée, après la longue journée vécue par nos chasseurs.

En bien, non! Les Inuit ne se fatiguent jamais dans ces circonstances; c'est cela la réalité.

Une erreur de ce genre aurait pu bloquer irrémédiablement le futur professseur ne pouvant reconnaître l'authenticité d'une telle affirmation en «inuktitut». Enseigner la langue, c'est enseigner aussi le contenu des mots dans un contexte fidèle à la réalité.

Maintenant je vais considérer les nécessités de la *forme*.

L'enseignement, et sa contre-partie l'apprentissage, sont des expériences qui découlent de la vie même. Elles sont censées être à la disposition de celui qui veut essayer de les assimiler. Il n'est donc pas question de proposer des formules artificielles, devinettes, exercices de contenus contradictoires ou autre, qui pourtant ont fait leurs preuves dans les cultures occidentales.

Ainsi avons-nous été contraintes d'utiliser les formes *naturelles* de la communication orale. Les *dialogues* et les *récits* que nous avons composés permettront aux futurs professeurs de se sentir à l'aise avec ce matériel didactique. Celui-ci leur permettra également de découvrir progressivement des procédés d'enseignement tout à fait personnels, leur conférant une compétence certaine dans ce domaine.

Utilisation de notre méthode

Le premier livret: CONVERSATION INUIT I, conçu pour des débutants et composé de 14 leçons, pourrait être assimilé au cours d'un trimestre ou bien d'une session intensive d'environ cinq semaines.

Il pourrait également être utilisé pour des cours aux adultes organisés par les établissements d'enseignement du milieu inuit.

Les professeurs doivent être des Inuit — deux de préférence — enseignant de concert dans la salle de cours. Il leur faut acquérir un minimum de formation, et bénéficier d'un encadrement jusqu'à leur familiarisation avec les méthodes et le mode d'enseignement de l'établissement où ils sont appelés à travailler.

Si nous avons mentionné des Inuit comme professeurs, ce n'est pas que nous voulons écarter les non-Inuit de cet enseignement, mais bien parce que ce matériel pédagogique a été élaboré spécialement pour fournir aux Inuit des outils valables d'enseignement de leur langue comme langue seconde.

Il nous semble que cela leur revient en toute logique, parce qu'eux seulement, par l'expérience, pourront trouver la méthode d'enseignement qui conviendrait le mieux, parce qu'ils sont en mesure d'assurer sa plus grande efficacité, parce que leur présence dans la salle de cours et le contact fréquent avec les étudiants deviennent un atout au moment d'abattre la barrière culturelle.

Ces facteurs pourraient éventuellement les encourager à poursuivre d'autres expériences dans ce domaine[2].

Perspectives

Pour conclure, je vais mentionner deux observations concernant l'utilisation de notre matériel tel que décrit ci-dessus et les perspectives qui pourraient éventuellement se dessiner.

Premièrement, ce matériel didactique constitue une base solide pour ceux qui acceptent de consacrer le temps nécessaire à l'étude de la langue inuit, quels que soient leurs intérêts et, en même temps, il permet de se former une bonne idée générale de la langue et des modes de vie des communautés inuit du Québec, si l'on veut s'en tenir là.

Deuxièmement, la prise en charge de l'enseignement par des Inuit faciliterait éventuellement le développement d'une activité régulière dans un cadre universitaire.

Cette activité, débutant par un simple cours d'initiation à la langue, servirait ultérieurement de fondement à l'élaboration d'un programme d'études inuit accordant la place qui leur revient à des spécialistes Inuit de la langue.

En finissant, je souhaite que cela se produise dans un avenir assez proche, et que les programmes des universités du Moyen-Nord acquièrent une toute nouvelle dimension que leur conféreraient les Inuit (et les autres Autochtones bien sûr) oeuvrant dans nos établissements d'enseignement supérieur.

Université du Québec en Abitibi-Témiscamingue

Notes

1. Même si, délibérément, nous nous limitons à une simple *identification* des formes grammaticales, en ne fournissant que les indices nécessaires à la reconnaissance de celles-ci, nous proposerons, à la fin du livret un *glossaire* où l'on pourra trouver une définition sommaire des termes employés, donc de leur valeur grammaticale ainsi que des *tableaux* de déclinaison et de conjugaison.
2. C'est là une considération que ceux qui s'intéressent à la formation des jeunes Autochtones ne sauraient négliger. L'une des personnes qui a collaboré avec moi dans le travail décrit ici, s'est efforcée par la suite de recueillir du matériel didactique auprès des Aînés. L'autre rêve d'élaborer elle-même du matériel scolaire pour les élèves inuit.

DÉVELOPPEMENT DES RESSOURCES EN LOISIRS DANS LES COMMUNAUTÉS CRIES DE LA BAIE JAMES 1982–1986

Robert Sauvé
USTIO et Université du Québec en Abitibi-Témiscamingue

Résumé: Dans sa communication, l'auteur récapitule l'expérience du développement des ressources ludiques dans les communautés cries de la Baie James. Les principales étapes de ce développement sont: la réalisation d'un plan de développement des ressources ludiques, l'élaboration et la réalisation d'un programme de formation en loisir spécialement adapté aux besoins de la clientèle crie, la mise en place d'un mécanisme de suivi pour ce programme de formation et la révision du plan de développement.

Cette expérience permet de faire quelques constats et de tracer un embryon de modèle de développement socio-économique pour les populations cries de la Baie James.

Abstract: The author summarizes experience in developing the leisure resources of the Cree communities of the Baie James. The principal stages of this development are: the establishment of a plan for the development of leisure resources; the development and initiation of a leisure training program especially adapted to the needs of the Cree clients, the establishment of a follow-up mechanism for this training program and revision of the development plan.

This experience makes it possible to draw certain conclusions and to outline a tentative socio-economic development model for the Cree people of the Baie James.

Introduction

C'est avec plaisir que j'ai accepté l'invitation de participer à ce Colloque des universités du Moyen-nord. Ce n'est pas tous les jours que l'occasion se présente de rencontrer un groupe aussi imposant de chercheurs en milieu nordique et de pouvoir discuter avec eux. Je considère cette expérience très stimulante et j'espère avoir à nouveau l'opportunité de participer à ce genre de rencontre.

Tout comme Roméo Saganash qui m'a précédé, je fais partie du groupe USTIO. C'est un groupe de chercheurs, de professionnels et d'intervenants de domaines divers qui offrent, tant aux Nord-Canadiens qu'à la population de l'Abitibi-Témiscamingue, des services qui vont de la simple consultation ponctuelle jusqu'à l'élaboration et la réalisation de démarches globales de formation, de planification, de développement et même d'investissement dans divers domaines. Ainsi, USTIO n'est-il pas un simple bureau de consultants, mais plutôt un mini-centre de recherche, à but non lucratif, qui se spécialise dans le développement socio-économique des populations du Nord canadien ainsi que dans l'établissement de liens de toutes sortes entre les intervenants du Nord et du Sud.

A la fois généralistes et pluridisciplinaires, les interventions d'USTIO sont axées sur le développement socio-économique du Nord, en se fondant particulièrement sur la formation des ressources humaines.

Ce champ d'activité émerge en fait de la réalisation d'un projet auquel j'ai eu l'occasion de participer au cours des cinq dernières années. Il s'agit du développement des ressources ludiques dans les communautés cries de la Baie James.

Dans un premier temps, je vais récapituler le déroulement de ce dossier au cours des cinq dernières années, et ensuite débattre avec vous ce qui se dégage de cette expérience.

Évolution du projet

Il est maintenant bien établi que les loisirs occupent une place importante dans le cadre de vie de la plupart des sociétés modernes. Au cours des dernières décennies, la préoccupation de plus en plus grande pour la qualité de vie ont amené les autorités publiques, tant fédérales que provinciales et municipales à investir de plus en plus dans le domaine du loisir. De la même façon, le développement des ressources ludiques a pris une place prioritaire dans l'épanouissement des communautés cries de la Baie James aux alentours de 1980.

Après quelques tentatives infructueuses en vue d'articuler une politique de développement des ressources ludiques et d'obtenir des subventions de la part des Administrations fédérale et provinciales afin de développer ces ressources, l'Administration régionale crie a demandé au Conseil régional des loisirs de l'Abitibi-Témiscamingue, où je travaillais à l'époque, de préparer un plan triennal de développement des ressources ludiques pour l'ensemble des communautés cries du territoire de la Baie James.

Plusieurs objectifs étaient visés par cette opération. D'abord, on voulait déterminer les besoins des différentes communautés en matière de loisir, ainsi que les moyens permettant de satisfaire ces besoins. Inutile d'ajouter que, par moyens, on désignait surtout les

sources potentielles de financement (subventions et autres). On voulait également mettre en place une structure favorisant le développement des loisirs dans chacune des communautés, ainsi qu'une structure régionale étayant l'oeuvre de ces organes locaux.

Par ailleurs, on voulait que le développement du loisir rehausse la qualité de la vie dans les communautés. Sur ce plan, on émettait l'hypothèse selon laquelle l'organisation d'activités ludiques réduirait d'autant le vandalisme, la délinquance juvénile, l'alcoolisme et la toxicomanie.

De plus, on voulait que ce développement des ressources ludiques se fasse en harmonie avec la culture traditionnelle crie, et qu'il soit créateur d'emplois. Le plan de développement devait donc prévoir et permettre que les populations intéressées prennent en charge leur développement ludique à plus ou moins court terme.

On a effectué une tournée de chacune des communautés en évaluant les besoins ludiques de chacune d'elles et en recensant, de concert avec les intéressés, les ressources physiques, humaines et pécuniaires permettant de satisfaire ces besoins. À ce niveau, le plus difficile, c'était d'être réaliste. Évidemment, toutes les communautés voulaient avoir un centre sportif, un gymnase, un centre social, etc. Cette réaction était d'ailleurs compréhensible, car c'était inscrit dans la Convention de la Baie James et, avec tout ce qui s'était passé dans ces communautés depuis 1975 (construction de maisons, d'écoles, de dispensaires, etc.), tout paraissait possible.

Quoiqu'il en soit, on a réussi semble-t-il à articuler un plan triennal de développement réaliste et réalisable, proposant un certain nombre d'initiatives qui permettraient aux communautés de se doter de ressources ludiques minimales.

Toutefois, il est vite apparu que pour concevoir les structures et les programmes ludiques correspondant vraiment aux besoins, tenant compte de la dimension culturelle et favorisant la prise en charge locale, il fallait d'abord et avant tout former les ressources humaines.

On est donc passé à ce que j'appellerai la phase II du projet. L'Administration régionale crie a demandé à la Commission scolaire crie de former des coordonnateurs des loisirs pour chacune des communautés. Avec la collaboration de l'Université du Québec en Abitibi-Témiscamingue et du Collège de l'Abitibi-Témiscamingue, un programme de formation de niveau collégial a été élaboré. À partir du programme de technique ludique du Ministère de l'éducation du Québec, on a élaboré un programme de formation pour répondre aux besoins particuliers de la clientèle crie.

Après de longues et difficiles négociations, le programme a été accepté par le Ministère de l'éducation sur une base expérimentale d'un an, et assorti d'une Attestation d'études collégiales.

À partir de 22 étudiants intéressés, on a inscrit un groupe de 13 étudiants. Le programme a été dispensé par la Commission scolaire crie, avec l'étroite collaboration de l'UQAT qui assumait l'encadrement général du programme, de même que la coordination pédagogique. Le certificat était conféré par le Collège de l'Abitibi-Témiscamingue. D'une durée de 44 semaines, le programme comprenait 32 semaines de cours théoriques et pratiques qui ont été donnés à Val d'Or, et 12 semaines de stages, dont 8 dans les communautés

respectives des étudiants. Après évaluation, on a constaté qu'il aurait fallu donner la plus grande partie de la formation directement sur le terrain, dans les différentes communautés. C'est pour des raisons strictement d'ordre budgétaire qu'il il a été impossible de réaliser le programme de cette façon.

Il est important de souligner que, tout au long de la formation, le plan de développement des ressources ludiques a constitué, en quelque sorte, la Bible du programme de formation. Cela correspondait à ce qui attendait les étudiants à la fin du programme; c'était du concret et il était clair que leur formation visait à la mise en oeuvre, non pas de ce plan en particulier, mais de quelque chose de semblable.

Une fois le programme achevé, les étudiants sont retournés dans les communautés en janvier 1985. Onze étudiants se sont trouvés du travail en loisirs, et les deux autres dans des domaines voisins. Toutefois, vous comprendrez qu'il est difficile à un étudiant, qui n'a suivi qu'un cours accéléré d'un an, d'assumer la direction du développment des loisirs dans sa communauté. De plus, le plan triennal en était déjà à sa troisième année, les besoins avaient évolué, etc. On a donc mis en place une structure de suivi sous forme de séminaires qui se déroulent trois ou quatre fois par année.

On s'est donné d'abord comme objectif de reviser de concert le plan de développement. Deux étudiants que je supervisais ont assumé la coordination de la démarche achevée récemment. À noter que toute cette démarche de suivi est assumée par USTIO et que c'est Roméo, un des ex-étudiants, qui en assure la coordination.

Outre la révision du plan, on débat les problèmes que chacun rencontre, on élabore la programmation régionale et, à chaque séminaire, on traite plus en profondeur d'un sujet tel que la budgétisation des loisirs, la programmation des activités sportives et culturelles, etc.

On peut donc affirmer que le processus de prise en charge du développement du loisir est bien enclenché et que, dans un ou deux ans, les communautés cries seront parfaitement autonomes en ce qui concerne le développement de leurs loisirs.

Quelques constats

Cette série d'interventions sur le développement du loisir dans les communautés cries de la Baie James ne constitue pas un programme de recherche en soi. Peut être, tout au plus, est-ce de la recherche-action. Mais il se dégage de cette expérience quelques observations intéressantes qui méritent d'être étudiées plus en profondeur, et qu'on pourrait peut-être appliquer dans d'autres secteurs du développement socio-économique des communautés cries.

Le lien direct établi entre la planification du développement socio-économique et le développement des ressources humaines apparaît intéressant. Cette planification permet d'identifier les besoins, de même que les ressources nécessaires pour y répondre. Cette information permet ensuite d'élaborer un programme de formation concret, axé directement sur les postes à combler. Il est, de plus, possible d'évaluer le nombre de postes potentiels, la nature de ces postes, etc. Autre avantage de ce modèle, la mise en place d'un programme

de formation permet d'enclencher de façon très concrète le processus de prise en charge dans un secteur d'activité donné, ce qui augmente également les possibilités de mise en oeuvre des propositions contenues dans le plan de développement.

Il y a donc là un embryon de modèle de développement socio-économique qui semble fonctionner pour les communautés et les entités cries, et qui pourrait peut-être s'appliquer à d'autres peuples subissant sensiblement les mêmes contraintes en matière de développement socio-économique. Je pense, par exemple, aux communautés inuit, et à quelques peuples africains ou d'Amérique latine.

L'utilisation tant générale que sectorielle de ce processus offre également certaines garanties que le transfert culturel des connaissances et des techniques se fait selon le désir des populations concernées. Le choix de l'orientation de leur développement par les populations concernées, préalablement à la formation d'une clientèle et à partir d'un programme spécialement adapté à ses besoins constitue une triple mesure de contrôle à cet égard.

Ces conditions amènent les intervenants extérieurs à limiter leur rôle à celui d'un traducteur qui article des informations et des connaissances et les rend compréhensibles et utilisables par la clientèle concernée.

Conclusion

Je crois personnellement à un processus au cours duquel le programme de recherche émerge d'une série d'interventions au sein du milieu. Cette théorisation ou, à tout le moins, cette modélisation de la réalité ou de la vraie vie constitue, pour moi, une forme de recherche-action intéressante qui a sa place dans le développement socio-économique des populations nordiques.

Devant l'urgence d'agir, alors que tout est à faire, USTIO entend poursuivre ses activités de recherche dans cette direction. Incidemment, une équipe d'USTIO compte prochainement utiliser le même processus, mais cette fois dans le domaine des communications. Une évaluation systématique de ces interventions sera faite à partir d'une approche plus expérimentale. De plus, USTIO entend oeuvrer activement, par le biais de ces projets et expériences, à l'élaboration d'un modèle d'intervention en développement socio-économique pour les populations isolées et peu nombreuses.

DÉCOUPAGES TERRITORIAUX ET JURIDICTIONS POLITICO-ADMINISTRATIVES EN ABITIBI-TÉMISCAMINGUE ET BAIE JAMES

Enrique R. Colombino
Département des Sciences sociales et de la santé,
Université du Québec en Abitibi-Témiscamingue

Résumé: Quel est le poids déterministe de la dimension politico-administrative de la territorialité dans le processus de développement régional?

Le développement en région est-il devenu un processus de nature plus politico-administrative que social et économique?

Pour répondre à ces questions, l'auteur fait d'abord un inventaire systématique de la territorialité des organismes publics et para-publics oeuvrant dans le développement de la région Abitibi-Témiscamingue et Baie James, dans le Nord-ouest du Québec.

Le répertoire cartographique des découpages territoriaux est suivi d'une étude des juridictions politico-administratives des organismes intervenants publics et para-publics.

Abstract: What is the weight of the politico-administrative dimension of territoriality in regional development processes?

Has regional development become more of a politico-administrative process than a social and economic one?

To reply to these questions, the author first takes inventory of the territoriality of public and para-public organizations involved in the development of the Abitibi-Temiscamingue and Baie James regions of northwestern Quebec.

The overview of sphere of influence is followed by a study of the politico-administrative jurisdictions of public and para-public organizations.

Problématique

Le processus de développement économique et social des régions évolue et se fonde sur l'interaction des facteurs humains, physiques et techniques. Évidemment, cette interaction entre les trois milieux est d'une grande complexité, ce qui explique en partie la relative impuissance des sciences sociales à rendre compte de la véritable «nature» du processus de développement régional.

Sans prétendre élaborer ici une définition, on peut assimiler pour le moment le milieu humain à l'espace social où les individus et les collectivités (ménages, familles, rang rural, quartier urbain, etc.) expriment leurs attentes, leurs valeurs et leurs besoins, tout en poursuivant un ensemble d'objectifs sous la forme de projets individuels ou collectifs.

Dans la même veine, on perçoit le milieu physique comme étant l'assise du devenir du milieu humain, l'ensemble des conditions géospatiales influençant ou rendant possible d'échec ou la réussite des projets humains. En tant que tel (espace géopolitique, territoire, propriété immobilière ou foncière) le milieu physique a été depuis les temps les plus reculés, et est encore l'objet de convoitises et d'un profond désir d'appropriation.

Quant au milieu technique, on peut le considérer provisoirement dans un sens très large comme étant «l'espace des moyens»; dans ce sens, il comprend autant les objets, les outils et les équipements matériels que les individus se donnent pour réaliser leurs rêves et satisfaire leurs besoins, que les règles de comportement et de discipline sociale leur permettant la poursuite et l'atteinte d'objectifs plus ou moins explicites.

Dans ce dernier sens, et cela est important pour notre projet de recherche, (Tableau I) on doit mentionner ici les moyens organisationnels (entreprises et organismes publics, semi-publics et privés) et les règles politico-administratives encadrant leur fonctionnement (lois et règlements, chartes, statuts, mandats, etc.).

Nous nous rapprochons ainsi d'une mise en place du «décor» du développement régional.

L'une des conclusions issues de l'analyse du processus de développement des régions du Québec au cours des dernières décennies, est celle du rôle important et parfois décisif joué par les appareils gouvernementaux dans ce processus[1].

Qu'on considère le niveau fédéral, le niveau provincial, ou en dernier lieu le niveau municipal, dans la plupart des cas étudiés le constat est assez unanime: le pouvoir étatique, basé sur une assise physico-spatiale impressionnante et des moyens organisationnels et réglementaires en constante expansion, garde la haute main sur le devenir des projets humains, c'est-à-dire sur le développement social, économique et politique des sociétés régionales.

Ce constat devient le point de départ de notre investigation appliquée à notre région, le Nord-ouest québécois. Il devient aussi une première orientation du projet, lequel vise à attirer l'attention sur la dimension territoriale du développement et sur la forte imprégnation politico-administrative de cette dimension.

Face au «possibilisme» humain, face au désir d'évolution et de changement perceptible dans les projets individuels et collectifs, quel est le poids déterministe de la dimension politico-administrative de la territorialité?

Le développement régional est-il devenu un processus plus politico-administratif que social et économique?

Tableau I — Présentation du projet:
Découpages territoriaux et juridictions politico-administratives en Abitibi-Témiscamingue et Baie James

Objectifs:

1) Réaliser un inventaire systématique de la territorialité des organismes publics et para-publics oeuvrant dans le développement du Nord-ouest québécois (Abitibi-Témiscamingue -- Baie James), en rapport à leurs juridictions politico-administratives.
2) Élaborer un répertoire cartographique des différents découpages territoriaux (régions et sous-régions, aires géographiques, zones, etc.) des organismes publics et para-publics des trois paliers gouvernementaux en région.
3) Présenter les résultats de l'enquête de manière à permettre une visualisation claire et agréable, une consultation aisée et une mise à jour périodique.

Démarche:

— Conception d'un PLAN D'INVENTAIRE original, par palier gouvernemental, par ministère en région, par secteur d'intervention, par organisme (bureau, délégation, direction, etc.), par entreprise publique ou para-publique.

Conception et élaboration d'un MODE DE COMPILATION de l'information recueillie, adapté aux objectifs du projet.

Dans un premier temps on peut envisager l'élaboration de fiches signalétiques, de fiches cartographiques et de fiches documentaires (juridictions) pour chaque organisme répertorié, sous le mode manuel; dans un deuxième temps, il faudra faire appel au mode informatisé.

— Les deux opérations ci-dessus donnent lieu à un PLAN DE TRAVAIL DÉTAILLÉ, avec une répartition des tâches, une division spatiale des opérations de recueil, un échéancier pour les différentes étapes et une stratégie générale des travaux visant à accélérer la réalisation et à réduire les «temps morts».

Dès le départ, l'équipe de recherche doit prévoir le type de «produit» principal envisagé, y compris son mode de présentation. Compte tenu du type d'information compilée (possibilité d'informatiser) et d'un certain graphisme (cartes, par ex.) impliqué, ces aspects présentent des volets techniques et budgétaires à considérer avec attention.

Équipe de recherche: Pour le Groupe de recherche et d'expérimentation sociale (GRESAT/UQAT):
Mme Cécile SABOURIN
M. Enrique COLOMBINO
professeurs d'économie politique à l'UQAT, département de sciences sociales et de la santé; pour le Département d'histoire et de géographie:
M. Maurice ASSELIN
M. Julien RIVARD
professeurs de géographie au Collège de l'Abitibi-Témiscamingue (C.A.T.).

Les études qu'il faudra entreprendre suite à ce premier inventaire des découpages territoriaux en Abitibi-Témiscamingue et Baie James, devront prendre en considération ces importantes questions, et tenter d'y répondre.

Références

1. Voir: Région, régionalisme et développement régional. Le cas de l'Est du Québec, sous la direction de Bruno Jean et Danielle Lafontaine. Rimouski, UQAR, 1984.

Alain-G. Gagnon: Développement régional, Etat et groupes populaires. Hull, Editions Asticou, 1985.

La bibliographie «régionaliste» au Québec est de plus en plus nombreuse et variée.

LE PROJET «GRAND CANAL»: UNE GRANDE IDÉE QUI DEMANDE DE LA RECHERCHE

Hilaire Boissé

Directeur général de la Fondation de recherche de l'Université du Québec en Abitibi-Témiscamingue

Résumé: Construction d'un ouvrage qui permettrait de recycler 20% de l'eau douce de nos rivières s'écoulant dans la Baie James, vers les grands lacs d'où partirait un réseau de canalisation vers les parties du continent déficitaires en eau douce.

Abstract: The paper describes a system which would permit the recycling of 20% of the water which presently flows into Baie James. This water would be redirected into the Great Lakes whence, via a network of canals, it would be distributed to parts of the continent which are short of water.

L'Eau

Matière première que nous avons en abondance, mais que nous consommons sans discipline ni aucune restriction dans le coin d'Amérique du Nord que nous habitons.

Savons-nous que nous sommes des privilégiés puisque nous faisons partie des 16 pour cent de la population du globe qui n'a aucun problème d'alimentation en eau douce?

Savons-nous qu'une partie du Centre-ouest canadien et américain sont aux prises avec les conséquences de la sécheresse occasionnée année après année par la baisse dramatique des nappes d'eau de leur sous-sol?

Savons-nous qu'avec la période de réchauffement qui est prévue cette situation ne fera qu'empirer?

Savons-nous que cette situation pourrait être grandement améliorée si l'on dérivait une partie de l'eau douce de nos rivières du Nord qui se déversent dans la Baie James?

Savons-nous que cette eau pourrait être utilisée par la construction d'un «GRAND CANAL» qui aurait la Baie James comme point de départ et les GRANDS LACS comme point d'arrivée?

Eh bien j'espère ne rien vous apprendre en vous disant qu'un ingénieur canadien du nom de Tom Kierans travaille depuis plus de 25 ans à promouvoir le projet du «GRAND CANAL» qui permettrait la mise en place d'un réseau de distribution d'eau douce s'étendant à tout le continent nord-américain.

Qu'est donc ce grand ouvrage?

La source:

La construction de digues d'est en ouest dans la Baie James, à la base de la Baie d'Hudson, permettrait de créer un immense lac d'eau douce qui serait alimenté par les rivières s'y déversant. Vingt pour cent de cette eau douce pourrait être acheminée vers les Grands Lacs.

Les voies d'acheminement:

L'eau tirée de ce nouveau lac, et acheminée par canalisation et stations de pompage par-dessus la ligne de partage des eaux entre les rivières coulant vers le sud et le nord, s'écoulerait par gravité dans les cours d'eaux qui se déversent déjà dans les Grands Lacs.

Régularisation et distribution:

Rivières et lacs situés sur le parcours pourraient être utilisés pour le stockage des eaux et la production d'électricité grâce à des turbines simples ou réversibles selon les endroits, accroissant ainsi notre potentiel énergétique entre la Baie James et les Grands Lacs, d'où partirait un réseau de canaux vers les régions manquant d'eau douce.

Avantages du «GRAND CANAL»

Sa construction offrirait de nouveaux outils de gestion et une nouvelle source d'approvisionnement pour satisfaire les besoins croissants en eau douce. Elle ouvrirait la voie à plusieurs réalisations pouvant être envisagées par la suite, par exemple le drainage des terres à vocation forestière traversées par les ouvrages à construire.

Eau disponible et régularisée

En voici quelques utilisations: approvisionnement en eau douce pour les Canadiens et les Américains, soit en eau potable et eaux pour usage industriel. Il permettrait de compenser l'augmentation de la consommation d'eau dans les bassins des Grands Lacs et du Saint-Laurent, suite au changement climatique et à l'essor économique.

Prévention des inondations

Prévention de la sécheresse

Prévention de l'érosion des sols

Cette possibilité de gérer l'approvisionnement en eau douce de haute qualité ferait aussi disparaître de nombreuses contraintes freinant le développement économique et gênant le maintien de la qualité de la vie dans plusieurs régions de notre continent.

Il y aurait beaucoup d'autres avantages d'ordre social, économique et environnemental que je pourrais énumérer, mais je vous laisse le soin de les imaginer vous-mêmes, ou de les retrouver en lisant une récente brochure sur ce sujet.

Les précédents

À prime abord, l'ampleur du projet surprend; réfléchissons cependant, et nous découvrirons que nous avons réalisé, depuis une centaine d'années et plus, des projets importants qui rendent d'immenses services à nos populations. Nommons-en quelques-uns, proches de nous:

— Voies ferrées de l'Atlantique au Pacifique

— Voie navigable de Sorel à New-York

— Voie maritime du Saint-Laurent

— Canal de Welland

— Les récents aménagements hydro-électriques de la région de la Baie James.

D'autres projets gigantesques ont été réalisés pour la gestion de l'eau dans d'autres pays et sont encore fonctionnels, en Hollande, en Chine, en Californie, et autre fois dans la Rome antique.

Aspect juridique du projet

La gestion des eaux dans les zones limitrophes de nos deux pays n'est pas nouvelle; en 1909, on a ainsi créé la Commission mixte internationale pour résoudre les questions concernant les eaux frontalières.

Elle a négocié nombre de traités depuis cette date; vous en trouverez la liste dans le dernier rapport des activités de cette Commission pour la période 1983–1984.

Enquête sur la politique fédérale relative aux eaux

Extrait du Rapport définitif de P.H. Pearse, F. Bertrand et J.W. MacLaren; Septembre 1985; pp. 147, 153, 154.

> «Il nous semble donc approprié d'étudier la question générale de l'exportation de l'eau et de prendre position de façon générale sur la question. . . Nous devrions être prêts à accueillir les propositions qui se présenteront dans les années à venir. . . En plus de préciser les critères de recevabilité, le gouvernement devrait définir des mécanismes stricts d'évaluation des propositions d'exportation. Ces mécanismes devraient comprendre des dispositions explicites applicables à la présentation des projets, à leur mode de traitement par le gouvernement et à leur évaluation par le public.»

Recherches universitaires

Un projet de cette ampleur ne constituerait-il pas un thème de puissant intérêt pour le monde universitaire? Presque aucune recherche n'a été accomplie à son sujet, que ce soit sur le plan de l'environnement humain, sur ses conséquences pour les populations riveraines des ouvrages à construire, sur ses effets sur la faune, la flore, le climat, sur les coûts, la rentabilité directe et indirecte, les aspects juridiques, l'énergie consommée et celle qui sera produite, etc. . .

Autant de sujets qui pourraient intéresser les chercheurs de nos universités pendant les prochaines années.

Le message est donc transmis: que ceux qui ont le goût d'oeuvrer à la gestion d'une de nos plus grandes richesses (l'eau) s'engagent en ce domaine!

LES FONDS SONT DISPONIBLES AU CONSEIL NATIONAL DE RECHERCHES DU CANADA POUR TOUS LES PROGRAMMES DE RECHERCHE À CE SUJET PRÉSENTÉS PAR LES CHERCHEURS DE NOS UNIVERSITÉS, SELON LES DIRES DU PROMOTEUR: «*M. Tom Kierans*».

Note

This presentation produced a strong reaction at the Sudbury meetings. We offer the following short bibliography for those who wish to read further on this controversial topic (eds).

Remarque

Cette communication a provoqué une forte réaction lors de la Rencontre de Sudbury. Les lecteurs qui voudraient s'informer davantage sur ce sujet controversé pourront consulter la courte bibliographie qui suit (dir. de public.).

Bocking, Richard C. Canada's Water for Sale?, James, Lewis and Samuel, Toronto, 1976.
Bourassa, Robert. Power from the North, Prentice-Hall, Canada Inc., Scarborough, 1985.
Foster, Harold D. & Sewell, Derrick. Water: The Emerging Crisis in Canada, James Lorimer & Co., Toronto, 1981.

The GRAND Canal Company Ltd. Introduction to the GRAND Canal: A Canadian Water Management Concept for the 21st Century?, (Company Document), October 12, 1985.
Keating, Michael. Water Overuse Haunts U.S. West, Globe and Mail, Toronto, August 21, 1985.
Keating, Michael. Drought Exacerbates Water Crisis, Globe and Mail, Toronto, August 21, 1985.
Keating, Michael. Fighting Looms Over the Waterhole, Globe and Mail, Toronto, August 19, 1985.
Keating, Michael. Adopting Conservation a Way Out of Hot Water, Globe and Mail, Toronto, August 22, 1985.
Kierans, T.W. "The Great Recycling and Northern Development (Grand) Canal" in Ontario, Futures in Water, Toronto, Queen's Printer, 1985, pp. 124–142.
Kierans, T.W. "The GRAND Canal Concept", Engineering Journal, Vol. 48, No. 12, 1965, pp. 39–42.
Pringle, Lawrence. Water: The Next Great Resource Battle, MacMillan, New York, 1982.
Richardson, Boyce. James Bay: The Plot to Drown the North Woods, Clark Irwin and Co. Ltd., Toronto, 1972.
Scott, A. The Economics of Water Export Policy, Ottawa, Federal Inquiry on Water Policy, March 1985, Research Paper No. 7.
Tiner, Tim. Dealing Canada's Water Wealth, NOW, Dec. 5–11, 1985.
Weller, G.R. Blue gold and Bourassa, the bonanza from the North. Paper prepared for annual meetings of the Western Social Science Association, Reno, Nevada, April 1986.

ÉTUDES ET PROSPECTIVES ENVIRONNEMENTALES SUR LE TERRITOIRE NORDIQUE DU QUÉBEC

Roger Lemire
Université du Québec en Abitibi-Témiscamingue

Résumé: L'Université du Québec en Abitibi-Témiscamingue place la recherche en milieu nordique parmi ses priorités. Sa présence active dans plusieurs communautés de la Baie James et du Nouveau-Québec, et son Sous-centre permanent de Radisson font de l'Université du Québec en Abitibi-Témiscamingue l'établissement d'enseignement supérieur nordique du Québec. En collaboration avec les Autochtones de la Baie James et du Nouveau-Québec, cette Université veut mettre sur pied, le plus tôt possible, des programmes de recherches en sciences environnementales et biophysiques.

L'auteur présente un aspect du volet «recherches» qu'entend poursuivre l'Université du Québec en Abitibi-Témiscamingue dans le territoire nordique du Québec.

Abstract: L'Université du Québec en Abitibi-Témsicamingue (UQAT) places northern research among its highest priorities. Through its active presence in many Baie James

and Nouveau Québec communities and its permanent sub-centre at Radisson, UQAT is *the* northern institution of higher learning of Quebec. In cooperation with the native people of Baie James and Nouveau Québec, UQAT hopes to establish, as soon as possible, research programs in environmental and bio-physical sciences.

The author presents a view of the research which UQAT intends to pursue in northern Québec.

En 1981, le Comité d'études sur la recherche nordique publiait son rapport sur *Les défis de la recherche nordique au Québec*. Son mandat consistait à préciser les besoins, les caractéristiques et les modalités de coordination de la recherche nordique au Québec. Ce document nous paraît toujours d'actualité en 1986, car plusieurs des problèmes considérés à ce moment n'ont pas encore trouvé de solution. Voilà pourquoi le Comité qui a préparé le *Bilan de l'activité scientifique et technologique de l'Abitibi-Témiscamingue* (1985) pour le Conseil de la science et de la technologie s'est largement inspiré de ce rapport. Par ailleurs, en 1984, l'Université du Québec en Abitibi-Témiscamingue (UQAT) a proposé un plan d'intervention concernant l'enseignement et la recherche qu'elle pourrait articuler sur le territoire nordique du Québec.

En signant la Convention de la Baie James et du Nord québécois, le gouvernement du Québec a pris des engagements dans les domaines de la santé, de l'éducation et de l'environnement, pour ne citer que ceux-ci, envers les populations autochtones de ce territoire.

Depuis quinze ans, la recherche en milieu nordique a surtout été axée autour des grands projets d'aménagement hydroélectrique: le Complexe La Grande, les projets Nottaway-Broadback-Rupert et Grande Baleine. Ainsi les objectifs de la recherche poursuivis servaient-ils d'abord les priorités des organismes s'occupant des aménagements hydroélectriques. Mais qu'en est-il des priorités de recherche des populations autochtones vivant en territoire nordique? Est-ce que l'éventail de leurs priorités de recherche a été établi et débattu au sein des communautés et villages?

Voilà bien des questions au sujet desquelles l'université régionale se doit d'être présente dans ces milieux pour répondre adéquatement à leurs interrogations. Néanmoins, l'université sera toujours disponible pour collaborer à la description et à la satisfaction des besoins de recherches des principaux intervenants sur le territoire (par ex.: Administrations fédérale et provinciales, Hydro-Québec, Société d'énergie de la Baie James (SEBJ) et Société de développement de la Baie James (SDBJ).

En plaçant la recherche en milieu nordique au centre de ses préoccupations, l'Université du Québec en Abitibi-Témiscamingue présente, dans l'exposé qui suit, une partie du volet «recherche» énoncé dans son plan d'intervention.

a) Étude de l'utilisation de la ressource piscicole renouvelable des grands réservoirs du Nord québécois

L'augmentation de la population piscicole dans les réservoirs du Complexe La Grande, depuis leur mise en eau, est certainement l'un des impacts positifs prévisibles des plus importants. Cependant, cette biomasse considérable n'est pas toute utilisable présentement,

car la création des réservoirs du Complexe La Grande a entraîné une augmentation significative (facteurs d'augmentation variant de 1,5 à 6,1 selon l'espèce et le réservoir) de la teneur totale en mercure de la chair des cinq espèces de poissons étudiées. Cette concentration mercurielle est relativement rapide durant les premières années chez les espèces non-piscivores, tandis qu'elle est plus graduelle chez les poissons piscivores. Chez le premier groupe, le maximum est atteint cinq ans après la mise en eau du réservoir, tandis que chez le second, le maximum sera vraisemblablement atteint après 7 ans (Messier et coll., 1985).

Plusieurs familles autochtones cries ont leurs terrains de piégeage dans les alentours des nouveaux réservoirs, où elles pêchent pour leur subsistance. Avec les techniques traditionnelles de pêche, les Autochtones capturent surtout les poissons les plus contaminés du plan d'eau: grand brochet (*Esox lucius*) et doré jaune (*Stizostedion vitreum*). Cependant, en modifiant leurs habitudes, les pêcheurs cries pourraient capturer des espèces de poissons dont la chair ne contient que des teneurs en mercure inférieures à la norme maximale fédérale de concentration. Voilà un bel exemple de transfert de connaissances qui peut être réalisé chez les Autochtones.

En ce qui concerne les espèces très contaminées, il y a également place pour la recherche sur l'utilisation de ces poissons comme nourriture dans les élevages de renards ou de visons, si ces marchés ne sont pas déjà saturés et que cette nourriture ne nuit pas à la reproduction des animaux d'élevage. Il est bon de mentionner qu'on peut envisager la récolte de poisson d'une biomasse de 2,5 kg/ha, soit environ 2500 t/a pour l'ensemble des réservoirs du Complexe La Grande (environ 600 t/a en particulier pour le réservoir LG 2). Cependant, la partie commercialisable de cette récolte n'atteint qu'environ 30%, ce qui donnerait 300 t/a pour le réservoir LG 2 (D. Roy, communication personnelle).

Il se peut aussi qu'il faille chercher d'autres sources de poissons à l'extérieur des réservoirs pour couvrir les besoins alimentaires de certaines familles pendant la période de pointe de concentration en mercure dans la chair des poissons des réservoirs.

b) Etude de la capacité biogénique pour le gibier

Malgré son immensité, le territoire nordique du Québec a une capacité limitée d'alimentation de la faune. En effet, la très courte période végétative et les conditions climatiques sévères de cette région nous invitent à évaluer très prudemment les possibilités d'utilisation de ses ressources fauniques. L'accroissement démographique et la mise en oeuvre d'un programme de sécurité du revenu minimum garanti augmenteront les prélèvements des chasseurs et risqueront de réduire le patrimoine faunique pour des générations à venir.

c) Études archéologiques

Jusqu'à maintenant, les études archéologiques du territoire nordique du Québec se sont limitées à la côte ouest de l'Ungava, à Fort McKenzie, dans la zone des réservoirs du Complexe La Grande et dans les zones des futurs projets Nottaway-Broadback-Rupert et Grande Baleine.

Il reste encore des milliers de kilomètres carrés où il est possible de découvrir d'autres sites et d'effectuer, par la suite, des fouilles archéologiques qui révéleront le passé des ancêtres autochtones. Ce type de recherche (archéologie) intéresse beaucoup les Amérindiens et les Inuit.

d) Vulgarisation scientifique

Voilà un thème qui, en lui-même, n'est pas de la recherche, mais qui en découle. Il se fonde sur la transmission des connaissances acquises par des communications, illustrations, et rencontres avec les communautés autochtones afin qu'elles puissent, pour préciser leurs besoins, utiliser les fruits de ces recherches lorsque celles-ci peuvent s'appliquer à leurs intérêts. Le centre de documentation de l'Université du Québec en Abitibi-Témiscamingue regorge d'études réalisées par les principaux intervenants (développeurs) et qui n'ont jamais fait l'objet de vulgarisation au sein de ces communautés.

Bibliographie

Comité du bilan de l'activité scientifique et technologique de l'Abitibi-Témiscamingue, Conseil de la science et de la technologie du Québec, 1985. Bilan de l'activité scientifique et technologique de la région Abitibi-Témiscamingue. Rapport nº 85-02, 327 p.

Commission de la recherche universitaire, Conseil des universités, 1981. Les défis de la recherche nordique au Québec. Rapport du Comité d'étude sur la recherche nordique. 119 p. et 7 annexes.

Messier, D., Roy, D. et Lemire, R., 1985. Réseau de surveillance écologique du Complexe La Grande 1978-1984. Évolution du mercure dans la chair des poissons. Direction Ingénierie et Environnement, SEBJ, 173 p. et 4 annexes.

LA RECHERCHE DANS LE SECTEUR MINIER

Michel Aubertin, Michel Hertel, Jean-Yves Savard et Pierre Verpaelst
Université du Québec en Abitibi-Témiscamingue

Résumé: Depuis 1982, l'Université du Québec en Abitibi-Témiscamingue (UQAT) a accru de façon notable le nombre et la qualité de ses interactions avec le secteur minier de cette région. Une évaluation préliminaire a fait ressortir les principaux besoins des entreprises minières en formation, recherches et services. Dans le but de pallier le manque de formation de la main-d'oeuvre, l'Université a mis sur pied un programme de recherches en enseignement professionnel. Au niveau de la recherche appliquée, il faudrait accomplir un plus large effort de recherches dans plusieurs disciplines reliées à l'exploitation minière: mécanique des roches, traitement des minerais, protection de l'environnement, ventilation, matériel des mines, recherche opérationnelle, informatisation et géostatistique.

Les chercheurs de l'UQAT ont déjà réalisé ou réalisent divers projets de recherche dans les domaines cités précédemment. D'autre part, la création toute récente d'une Unité de recherche et de service en technologie minérale (URSTM) permettait de regrouper les chercheurs de l'UQAT et ceux du Collège de l'Abitibi-Témiscamingue (CAT). Ce nouvel établissement de recherches ouvre plusieurs avenues fort intéressantes pour de nombreux exploitants miniers de l'Abitibi-Témiscamingue.

Abstract: Since 1982, l'Université du Québec en Abitibi-Témiscamingue (UQAT) has notably increased the quantity and quality of its interactions with the mining industry of its region. A preliminary evaluation has identified the principal needs of the mining companies in terms of training, research and other services. With a view to reducing the lack of training of the local work force, the University has initiated a program of research into professional training. In the sphere of applied research, a greater emphasis must be placed on research in various disciplines related to mining. These include rock mechanics, treatment of minerals, protection of the environment, ventilation, mining equipment, operations research, computer science and geo statistics.

UQAT researchers have already established or are establishing various projects in the abovementioned fields. Also, the recent establishment of a unit devoted to research and service in mineral technology (URSTM) will allow the pooling of researchers from UQAT and from the College of Abitibi-Témiscamingue. This new research enterprise opens several extremely interesting routes for many mining operations in the Abitibi-Témiscamingue region.

L'Université du Québec en Abitibi-Témiscamingue a une mission bien particulière: les distances, la faible densité de la population et une clientèle différente l'obligent à donner plus que la formation normalement exigée d'un établissement d'enseignement universitaire. La présence d'une université en Abitibi-Témiscamingue exige que cette dernière participe en permanence à l'identification des besoins de la population, tant collectifs qu'individuels, besoins liés, il va sans dire, au développement de la région. Compte tenu des ressources de celle-ci, il fallait s'attendre à ce que les chercheurs de l'UQAT s'intéressent particulièrement à l'ensemble du secteur minier. En effet, plusieurs projets de recherche ont été entrepris, qui témoignent de l'intérêt que l'Université du Québec en Abitibi-Témiscamingue porte à ses activités.

Il y a près de cinq ans, l'Université du Québec en Abitibi-Témiscamingue décidait de participer à l'effort du secteur minier. En tant qu'institution dont le caractère régional constitue une dimension importante, elle se devait de préciser son champ d'intervention dans ce secteur. Une évaluation des besoins en formation, en recherche et en service a donc été effectuée (Jean et Martin, 1982). Cette étude, qui touchait l'industrie de la prospection, de l'exploitation et de la transformation des ressources minières, confirma les besoins dans les trois volets précités, en formation, en recherche et en service.

Des mineurs formés à l'école

Dans un deuxième temps, une équipe de recherche en enseignement professionnel a été mise sur pied pour préciser les besoins de formation de la main-d'oeuvre dans le secteur minier. Le domaine de l'exploitation s'est avéré celui où les besoins étaient les plus

pressants. Nous avons donc étudié les besoins quantitatifs et qualitatifs de formation des mineurs et des mécaniciens de machines de mine, auprès de 13 entreprises qui exploitent des mines en Abitibi-Témiscamingue, de Rouyn à Chibougamau, et de Val d'Or à Matagami (Bergeron et coll., 1985).

Cette étude fait apparaître le besoin grandissant de main-d'oeuvre qualifiée dans les mines. Elle fait aussi ressortir les déficiences de la formation de base et les lacunes importantes de la notion de santé et de sécurité du travail. Ce dernier point avait d'ailleurs été mis en évidence lors de l'enquête sur la tragédie survenue à la Mine Belmoral, à Val d'Or, en 1980. Le métier de mineur n'est d'ailleurs pas reconnu au même titre que les métiers d'électricien, de mécanicien, de soudeur ou de travailleur de la construction. Or, les connaissances requises par l'introduction des technologies nouvelles nécessitent, de plus en plus, une formation de base adéquate. Par ailleurs, il n'existe actuellement aucun programme de formation professionnelle au secondaire pour les travailleurs miniers. Aussi a-t-on élaboré des programmes de formation professionnelle au secondaire pour les mineurs et les mécaniciens de machines de mines, qui tiennent compte de l'analyse des tâches et opérations afférentes (Verpaelst et Jean, 1984; Hertel 1984). Les deux programmes de formation professionnelle au secondaire ont été soumis au ministère de l'Education dont nous attendons l'approbation pour leur mise en oeuvre.

Depuis 1984, la recherche s'est orientée vers l'élaboration des activités d'apprentissage reliées aux contenus et objectifs des programmes; ces activités sont présentement expérimentées et évaluées en collaboration avec la Commission scolaire La Vérendrye, à Val d'Or.

Une autre étude a permis d'approfondir l'évaluation des besoins en recherche. Et c'est encore dans le domaine de l'exploitation minière que les besoins se font le plus sentir, plus particulièrement en mécanique des roches, en traitement des minerais, en protection de l'environnement, en ventilation de mine, en matériels de mine et recherche opérationnelle minière (Groupe de recherche en technologie minérale, 1983). Deux autres volets se sont ajoutés depuis, soit l'informatisation et l'évaluation géostatistique des réserves de minerais.

La mécanique des roches

Depuis octobre 1984, le professeur Michel Aubertin s'efforce de mettre sur pied un laboratoire de mécanique des roches, en collaboration avec les professeurs du département de technologie minérale du Collège de l'Abitibi-Témiscamingue. Cette action constitue un premier pas concret en faveur de la recherche en géotechnique minière dans la région.

Parallèlement, on lance également un projet de recherche appliquée sur le phénomène du coup de toit dans les mines souterraines, qui est apparu comme le pôle autour duquel s'articuleront les prochaines études en ce domaine. Ce phénomène, bien connu des exploitants, est essentiellement caractérisé par une rupture violente d'un volume de roche, qui engendre un effondrement partiel ou généralisé de l'excavation. Les risques de coups de toit, aussi appelés coups de charge («rockburst»), augmentent généralement avec la profondeur de l'exploitation minière, ainsi qu'avec l'étendue du chantier. Or, depuis quelques années, on constate une augmentation de leur fréquence, en raison des méthodes modernes de minage, par lesquelles on essaie de récupérer le maximum de minerai, en réduisant les coûts d'opération. En plus de constituer un sérieux danger pour la sécurité

des travailleurs, le risque de coup de toit peut causer des inconvenients économiques importants aux exploitants, en raison des retards occasionnés à la production par le déblaiement et la remise en état des excavations (MERQ, 1980; Whiteway, 1985).

Le projet principal de recherche sur ce phénomène consiste notamment à élaborer une méthode de localisation des zones les plus sujettes aux coups de toit dans une mine en exploitation ou en développement. Une telle étude fait appel à des connaissances multidisciplinaires. En effet, l'approche privilégiée pour résoudre ce problème nécessite des études géologiques et géomécaniques, et l'utilisation des méthodes numériques d'analyse par discrétisation (Venturini et Bebbia, 1983; Beer et Meek, 1981; Zienkiewicz, O.C., 1977). Une équipe multidisciplinaire a été formée, qui réunit des chercheurs de plusieurs institutions, en l'occurrence l'UQAT, l'Ecole Polytechnique, l'Université du Québec à Chicoutimi, le Collège de l'Abitibi-Témiscamingue, ainsi que des ingénieurs et géoscientifiques du secteur privé.

La géostatistique

Une bonne estimation des réserves minières constitue aujourd'hui un impératif pour bien orienter le développement et assurer la continuité de l'exploitation minière. La géostatistique est l'une des méthodes les plus éprouvées pour optimiser cette estimation (David, 1977).

Cette méthode est d'autant plus utile que le matériel informatique nécessaire est devenu plus accessible, même aux petites exploitations minières. C'est précisément l'un des objectifs visés par le professeur Michel Hertel, de l'UQAT, et par le professeur Michel David, de l'École Polytechnique, dans un projet de recherche sur l'estimation géostatistique des réserves minières dans un gisement de sulfures massifs. Ce projet a été rendu possible grâce à la collaboration de la mine Corbet, exploitée par la société Falconbridge Corp. à Noranda, et la participation financière du Centre de recherche minérale et du ministère de l'Enseignement supérieur, de la Science et de la Technologie du Québec. Ce projet a aussi pour but d'améliorer la conception graphique de certains programmes de géostatistique.

Le laboratoire de pétrographie

Depuis près de trois ans, l'étroite collaboration entre l'UQAT et le Collège de l'Abitibi-Témiscamingue a permis de mettre en commun les ressources humaines et matérielles nécessaires à la mise sur pied d'un laboratoire de pétrographie. Le but premier de ce laboratoire était la création d'un répertoire informatisé d'échantillons de roches de la région de Rouyn-Noranda, en complément de la lithothèque du ministère de l'Énergie et des Ressources. Nous voulions également offrir un potentiel de compétence en pétrographie à la communauté minière de la région, tant au point de vue formation que service. L'équipe du laboratoire a pu développer une problématique de recherche en accord avec ces objectifs. Un projet de recherche est aussi actuellement en cours de réalisation sur la stratigraphie et la gîtologie des roches volcaniques du Groupe de Blake River, à l'ouest de Rouyn-Noranda. Le principal objectif de cette recherche est de vérifier les corrélations possibles avec les unités géologiques déjà mises en évidence dans la région (Gélinas et coll, 1984; Dimroth et coll., 1982). Il s'agit surtout de voir si l'on peut découvrir des

unités géologiques semblables à celles où l'on a déjà trouvé des gisements. Ce projet est réalisé en collaboration avec le ministère de l'Énergie et des Ressources et subventionné par le ministère de l'Enseignement supérieur, de la Science et de la Technologie.

Recherche opérationnelle minière

La restructuration de l'UQAT, effectuée en 1984–1985, a favorisé le rapprochement des personnes-ressources de disciplines différentes et a suscité, chez certains chercheurs, un intérêt pour les problèmes de gestion des opérations minières. Cet intérêt est d'autant plus opportun que les mines doivent toujours viser à l'optimisation de leur production. Cette optimisation doit tenir compte des fluctuations du marché des métaux, de la hausse des coûts de production ainsi que des méthodes d'exploitation. Les chercheurs élaborent présentement un projet en recherche opérationnelle minière.

Une unité de recherche en technologie minérale

On peut dégager un dénominateur commun dans ces divers projets: le développement de l'industrie minière. La plupart des projets découlent de consultations préalables auprès des entreprises. Les contacts avec l'industrie sont donc généralement assez faciles. Afin de les rendre encore plus fructueux, le dernier bilan scientifique de la région de l'Abitibi-Témiscamingue recommandait la création d'une unité de recherche en technologie minérale. (Conseil de la science et de la technologie, 1985). L'un des objectifs de cette unité est de favoriser les échanges entre les établissements d'enseignement supérieur. Ce rapprochement devrait également permettre une meilleure lecture des besoins de l'industrie, d'une part, et un transfert technologique et scientifique plus efficace d'autre part. L'Université et le Collège de l'Abitibi-Témiscamingue ont donc mis sur pied cette unité de recherche en regroupant des chercheurs des deux institutions, de même que des représentants de l'industrie minière que la recherche et le développement intéressent (U.R.S.T.M., 1985).

L'Unité de recherche et de service en technologie minérale de l'Abitibi-Témiscamingue est un organisme issu du désir des dirigeants et du corps professoral du département des sciences appliquées de l'Université du Québec en Abitibi-Témiscamingue et de celui du département de technologie minérale du Collège de l'Abitibi-Témiscamingue, de regrouper l'ensemble des ressources humaines et physiques touchant le secteur minier. Suite à l'entente intervenue entre ces deux établissements, le développement des statuts et des infrastructures de l'URSTM a débuté dès l'automne 1985. Un Conseil d'administration formé de représentants de l'industrie minière régionale (3), de l'UQAT (3) et du CAT (3), fut alors mis sur pied. L'Unité a reçu une reconnaissance institutionnelle officielle au cours de janvier 1986.

Recherche, développement et service

L'URSTM se consacre principalement à l'intensification des efforts de recherche et de développement en faveur du secteur minier. D'autre part, l'Unité met également les compétences de ses professeurs-chercheurs au profit de l'industrie minière régionale, en offrant une gamme de services et de conseils techniques, qui permettent de combler certaines carences régionales dans des secteurs précis comme:

- essais et études minéralurgiques;
- essais de mécanique des roches;
- fabrication de lames minces et sections polies;
- location de certains équipements à court terme;
- consultation et formation en micro-informatique;
- dilution et pertes de minerai;
- autres questions (selon les développements futurs).

Les fonds recueillis lors de la fourniture de services et de conseils techniques servent à financer partiellement l'achat et le renouvellement d'équipements pour la recherche.

L'orientation des thématiques de recherche reflète les préoccupations quotidiennes des entreprises minières de la région, dans la mesure où il est possible pour l'URSTM de mettre sur pied les équipes de chercheurs possédant les compétences nécessaires pour mener à terme les projets entrepris. L'Unité n'hésite donc pas à s'associer avec d'autres institutions ou centres de recherche dans le but de réaliser des projets conjoints, dans des domaines où elle ne dispose pas de tout le personnel requis.

Les interventions de recherche de l'URSTM touchent plusieurs phases d'activités de l'industrie minière:

- Géologie;
- Exploitation minière et génie minier;
- Minéralurgie;
- Environnement minier.

Conclusion

Depuis sa création toute récente, l'URSTM s'impose comme un outil régional de première importance au niveau du développement de la R & D dans le domaine minier. L'Unité est forte d'un appui sans équivoque de l'industrie minière régionale, comme le montre la présence de plus de 25 membres recrutés parmi le personnel dirigeant et technique de cette industrie. Enfin, l'Unité de recherche et de service en technologie minérale de l'Abitibi-Témiscamingue demeure ouverte en tout temps à tous projets susceptibles de promouvoir l'essor de l'industrie minière régionale, en améliorant sa compétitivité sur les marchés internationaux.

Bibliographie

Beer, G. et Meek, J.L., 1981, Coupled Finite Element Boundary Element Analysis of Infinite Domain Problems in Geomechanics. Numerical Methods for Coupled Problems, Pineridge Press, p. 625–629.

Bergeron, C. Derome, C., Jean, J., Piard, C., Tremblay, S. et Verpaelst, P., 1985. Un modèle d'élaboration et d'évaluation de programme: formation du mineur au secondaire. UQAT, 54 pages.

David, M. 1977, Geostatistical Ore Reserve Estimation. Developments in Geomathematics 2. Elsevier Scientific Publishing Co., New York, 364 pages.

Dimroth, E., Imreh, L., Rocheleau, M. et Goulet, M. 1982. Evolution of the South-Central Part of the Archean Abitibi Belt, Québec. Part 1: Stratigraphic and Petrographic Models. Journal canadien des sciences de la Terre. v. 19, p. 1729-1758.

Gélinas, L., Trudel, P. et Hébert, C., 1984. Chemostratigraphic Division of the Blake River Group, Rouyn-Noranda Area, Abitibi, Québec. Journal canadien des sciences de la Terre, v. 21, p. 220-231. Groupe de recherche en technologie minérale, 1983. Évaluation des besoins en recherche dans l'industrie minière. Rapport interne.

Hertel, M. 1984. Programme de formation du mécanicien de machine de mine. UQAT. Rouyn, 152 pages.

Jean J. et Martin, P.A., 1982. Exploration et développement en technologie minérale. Rouyn, CEUAT, 157 pages. Unité de recherche et de service en technologie minérale, 1985. Plan de développement et d'orientation pour 1985-1986. 32 pages.

Venturini, W.S. et Brebbia, C.A., 1983. Some Applications of the Boundary Element Method in Geomechanics, International Journal for Numerical and Analytical Methods in Geomechanics, vol. 7, p. 419-433.

Verpaelst, P. et Jean, J. 1984. Programme de formation du mineur. 1ère version officielle pour expérimentation. UQAT. Rouyn, 179 pages.

Whiteway, P. 1985. $4.2 Millions Sought for Rockburst Work. The Northern Miner, April 4, p. A1-A6.

Zienkiewicz, O.C. 1977. The Finite Element Method. McGraw-Hill (UK). 787 pages.

ASSOCIATION OF CANADIAN UNIVERSITIES FOR NORTHERN STUDIES
ASSOCIATION UNIVERSITAIRE CANADIENNE D'ÉTUDES NORDIQUES

PUBLICATIONS

The Use of Greenlandic and Danish in Greenland Schools, 1980

Some Thoughts on the Current State of Teaching and Research about Northern Canada. T.H.B. Symons, April 1980

Proceedings of the First International Symposium on Renewable Resources and the Economy of the North, M.M.R. Freeman (ed.), 1981.

Ethical Principles for the Conduct of Research in the North/Principes d'éthique pour la conduite de la recherche dans le Nord, 1982 (also available in Inuktitut)

Resources and Dynamics of the Boreal Zone: Proceedings of a Conference held at Thunder Bay, Ontario, August 23–26, 1982. R.W. Wein, R.R. Riewe and I.R. Methven (eds.), 1983.

List of Northern Specialists at Canadian Universities/Liste des spécialistes du Nord dans les universités canadiennes, 1983

Social Science in the North: Communicating Northern Values, 1984.

Federal Government Resources for University Research and Science Training in the North/Ressources du gouvernement fédéral pour la recherche et la formation scientifique dans le Nord, 1984.

Guide to Northern Science Licences and Permits/Recherche Nordique — Répertoire des licences et permis, 1984.

Distance Education in the Canadian North: An Annotated Bibliography, 1984.

Canada's Northern Stations, G.T.J. Campbell and W.P. Adams (eds.), 1986.

Arctic Heritage, Proceedings of a Symposium, J.G. Nelson, Roger Needham and Linda Norton (eds.), 1987.

Education, Research, Information Systems and the North, W.P. Adams (ed.), 1987

Canada's Subarctic Universities/Les universités canadiennes du Moyen-Nord, W.P. Adams and D. Parker (eds.), 1987.

The ACUNS newsletter *Northline* appears four times a year, and is available free on request./Le bulletin de l'AUCEN *Point Nord* paraît quatre fois au cours de l'année. On peut l'obtenir gratuitement sur demande.

Association of Canadian Universities for Northern Studies
Association universitaire canadienne d'Études nordiques

The Association represents thirty-five Canadian universities active in northern studies research and training. Founded at Churchill, Manitoba in 1977, it is a federally incorporated charitable organization.

The purpose of the Association is the advancement of northern scholarship through education, professional and scientific training and research.

L'Association représente trente-cinq universités canadiennes actives dans le domaine des études, de la recherche et de la formation sur le Nord. Fondée à Churchill, Manitoba en 1977, c'est une organisation charitable, à but non lucratif et incorporée.

L'objectif de l'Association est l'avancement de l'érudition nordique, grâce à l'éducation, la formation professionnelle et scientifique, et la recherche.

BOARD OF DIRECTORS/CONSEIL D'ADMINISTRATION 1987–89

President/Président	Marc-Adélard Tremblay, Université Laval
Vice-President/Vice-Président	John K. Stager, University of British Columbia
Secretary-Treasurer / Secrétaire-trésorier	Frank Duerden, Ryerson Polytechnical Institute
Director/Directeur	James B. Carefoot, University of Regina
Director/Directeur	Hugh M. French, University of Ottawa
Director/Directeur	Marianne Stenbaek, McGill University
Director/Directeur	Geoffrey R. Weller, Lakehead University

MEMBERS/MEMBRES

University of Alberta • Brandon University • University of British Columbia • University of Calgary • Carleton University • Concordia University • Dalhousie University • Ecole Polytechnique • University of Guelph • Lakehead University • Laurentian University • Université Laval • University of Manitoba • McGill University • McMaster University • Memorial University • Université de Montréal • University of New Brunswick • University of Ottawa • Université du Québec à Chicoutimi • Université du Québec à Montréal • Université du Québec à Trois-Rivières • Université du Québec en Abitibi-Témiscamingue • Queen's University • University of Regina • Ryerson Polytechnical Institute • University of Saskatchewan • Simon Fraser University • University of Toronto • Trent University • University of Victoria • University of Waterloo • University of Western Ontario • University of Windsor • York University